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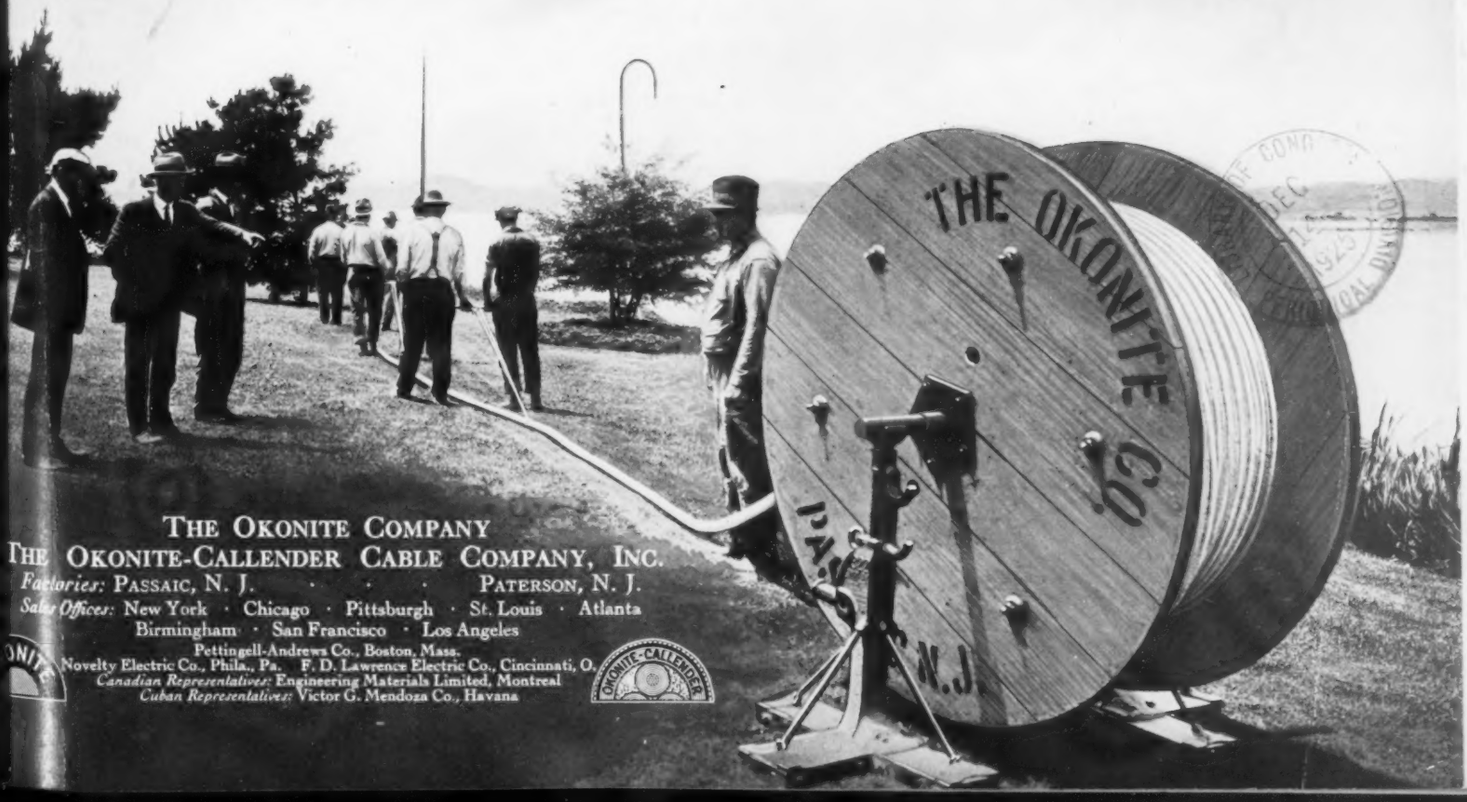
Journal of Electricity

Devoted to the Economic Production and Commercial Application of Electricity
IN THE ELEVEN WESTERN STATES

Installation of
OKONITE
"Parkway" Cable
Lead and Steel Taped
for the ornamental lighting around
Lake Merritt, Oakland, California



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R. N. PHELAN, Associate Editor

W. A. CYR, Associate Editor
B. H. SNOW, Northwest Editor

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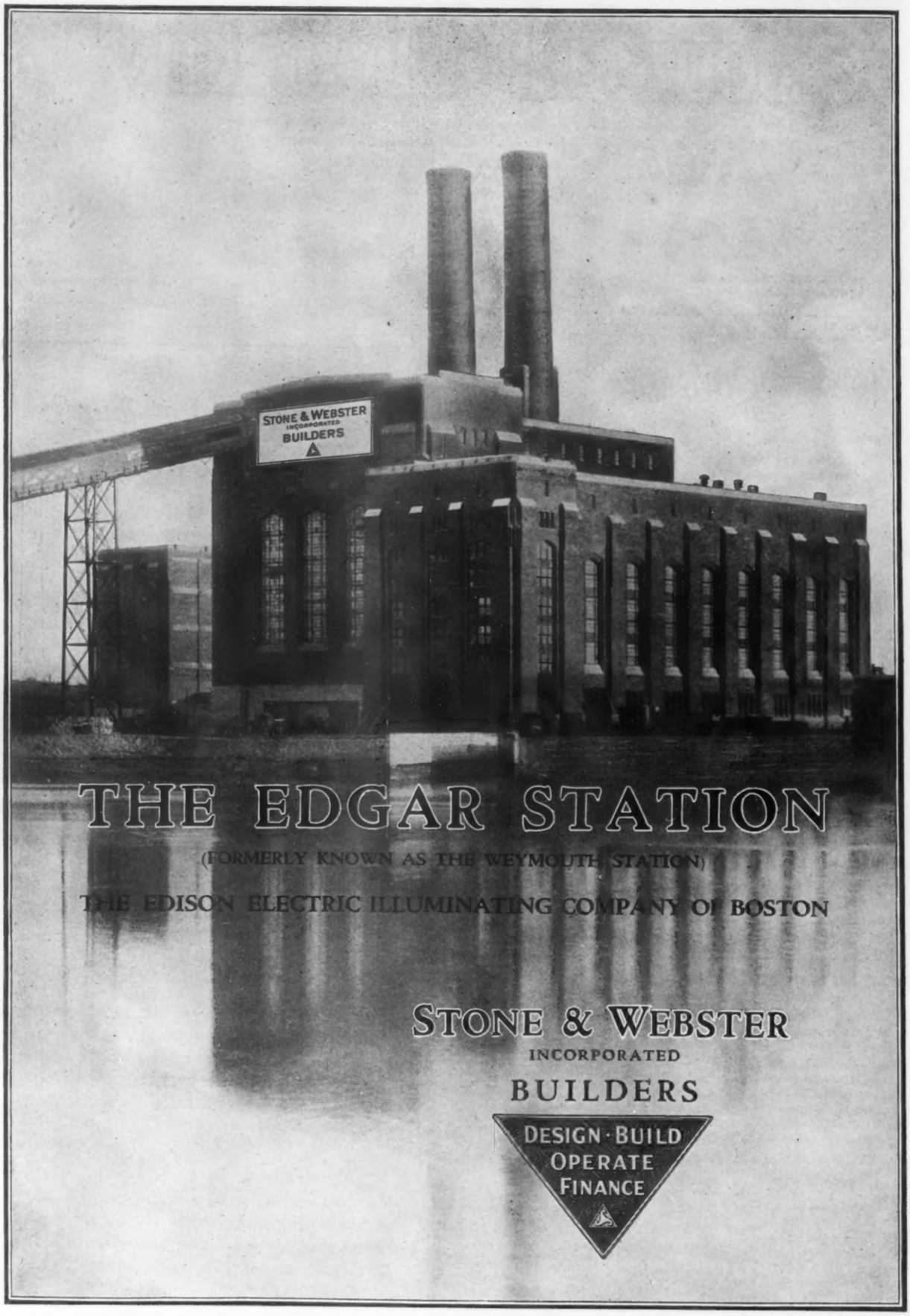
Commercial Possibilities of Floodlighting

FLOODLIGHTING of commercial, industrial and civic buildings is one of the latest developments in illumination. There is hardly a city in the West but what possesses an office building, a factory, a school or other civic building which will not lend itself admirably to this form of lighting. This field affords splendid opportunities for the entire electrical industry. For the manufacturer and jobber there are the profits on the material and equipment; for the contractor there is a sizable wiring job in each case, and for the central station there is a large and highly desirable load. By devoting close study to the subject of floodlighting the industry will not only open the door to new business but will be performing a civic duty, for a properly floodlighted building is a distinct asset to any community.

In this issue three of the most recent floodlighting developments in San Francisco are the topic of a lengthy article which goes into every phase of the subject. We recommend a careful study of this material.

To keep abreast of the times is one of the first requisites of a trade journal, and in presenting discussions of new developments of this character the Journal of Electricity meets this requirement.


STONE & WEBSTER
INCORPORATED
BUILDERS
THE EDGAR STATION
(FORMERLY KNOWN AS THE WEYMOUTH STATION)
THE EDISON ELECTRIC ILLUMINATING COMPANY OF BOSTON
STONE & WEBSTER
INCORPORATED
BUILDERS
DESIGN · BUILD
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EDITORIAL

A Brand of Service Beyond Criticism

PERHAPS no business more fully realizes the truth of the old proverb about the little things that count than that of the public utilities. It is the little things that frequently bring forth well-deserved letters of praise for both an employee and the corporation by which he is employed. This leads us to quote a letter recently received by the Los Angeles Gas and Electric Corporation:

"You will always receive complaints from users of your service, but you do not always receive commendations from those who have been helped when wires cross.

"I would be derelict in courtesy if I did not take the time to write you concerning a little thing one of your employees did that meant much to our comfort.

"Mrs. Barry reported to your office that our lights were off. Your service man arrived in a short time, but Mrs. Barry was not at home. Upon her return she found the lights on, a penciled note, written on the back of a laundry slip, which read as follows:

"'You phoned Los Angeles Gas and Electric for service on lights. We do not supply your light —Los Angeles City does. Bureau of Power and Light, 209 S. Broadway, Metropolitan 4200. However we have fixed trouble.'"

The act of the trouble man in this particular instance in displaying a brand of service beyond criticism is one of the things which makes the work of the public relations department more easy.

The Farmer Dislikes Subsidizing Public Ownership

IN advocating a general program of state tax reduction the California Farm Bureau has proposed two measures of decided importance to the electric light and power industry. The first is the elimination of tax-exempt securities and the second is the taxing of publicly owned utilities. This program has been adopted because the farmers of the state feel that the city dweller rapidly is shifting the cost of government to the shoulders of the residents of rural communities by causing them to pay to the city dweller a subsidy to enable him successfully to operate and own his municipal utilities—electric plants, street car systems and water works.

In a recent issue of one of the Farm Bureau publications it was pointed out that this subsidy amounts to 17.5 cents of every dollar which the farmer pays for electric service, being the total of taxes collected by the state and national governments from the privately owned utilities, together with the difference in interest rate between public and private bonds. Briefly, this subsidy is made up of a 7.8 per cent direct state tax on gross earnings and a direct tax levied by the federal government against capital stock and incomes that over a period of years has amounted to approximately 2½ per cent of gross earnings. Due to the fact that bonds of publicly owned utilities are tax-exempt while those of privately owned utilities are taxable, there is a differential in interest rates in favor of the tax-exempt securities of approximately 1¼ per cent. Records show that the average capital invested in utilities is approximately six times the gross revenue so this differential of 1¼ per cent really amounts to 7½ per cent of the earnings.

The California farmers are not the only group which would like to see the proposed measures passed. There are thousands of other electric consumers who are being subjected to the same subsidy. Perhaps the greatest good which would come from it would be that it would distribute the cost of government more evenly and it would place publicly owned utilities on a basis of fair competition with privately owned ones, thus giving the people an opportunity of judging which type of operation is really the better by a comparison of results arrived at under comparable conditions.

Insanity—or Just Foolishness?

WHEN the "movie" director wishes to signify by means of action that the mind of one of his characters has failed, there is one little stunt which never fails to register. The victim of delusion is set to perform the following little trick, seriousness written on every feature.

With the thumb and forefinger of the left hand the demented one is seen to make a circle through which, from below, he pokes the thumb of his right hand. Then with a stealthy, quick movement he tries to grab that protruding thumb with the hand of which the thumb is a part. The effect is ludicrous; one knows at once that the poor soul is hopelessly befogged, for no one in his right mind would grab at a thumb that he knew couldn't be there if it was on the hand with which the grabbing was to be done.

There is a parallel to this idiotic movement, in the method by which some well-meaning contractors approach an electrical installation. A consulting electrical engineer recently made the public statement that on a hotel job which his firm had laid out a contractor figured that the client could leave

out 1,350 outlets, and he sold his services on the saving that such a step theoretically would effect.

"If that is support from the contractor, when we are laying out jobs which will boost his game, at the same time giving the customer a high class job, I'll eat it," said this engineer. "Why, that fellow changed a hotel into an ordinary lodging house."

There is always the temptation to sell a cheaper job than the customer actually may want, on the theory that it is doing him a favor. Yet it hardly can be considered a favor to a customer to deprive him of a potentially high-class installation when he is willing to pay for it, and in fact may be anxious to have the very best. One first-class salesman at a luncheon of electrical men made this very point in the art of merchandising. He declared that a customer likes to be flattered by the thought that the one trying to sell him goods considers him as worthy of the very best, of appreciating quality, and of not being thought cheap.

The contractor who offers to cut out electrical convenience from any new job, in hopes of landing the job on price, is making just as ridiculous a spectacle of himself as the man who tries to grab the thumb that isn't there. And since, in the long run, it reflects in a serious manner upon his pocketbook, it is not only foolish, it is pathetic.

Don't Overlook the Washing Machine

IN all of the special sales effort now being made by the central stations for the promotion of the greater application of electricity in the home, what has become of the washing machine? It is granted beforehand that the ideal is the 100 per cent electrical home, and that the major theme in promoting this idea is the elimination of household drudgery. Advertising copy using the contrast appeal is especially effective, depicting the "Then and Now" idea; the spectacle of the housewife bending over a scrubbing board as opposed to the electrical servant typified by a modern electric washer strikes a responsive chord in the hearts of the majority of people.

True enough, the washing machine is not a great load-builder. About $2 per year is about the average revenue to the central station, and perhaps a little more when the electric iron is taken into consideration. But is this the only item for consideration? There is also the value of the washing machine as a builder of good will for the electrical idea in the home. Taken in the order of their relative importance as lighteners of domestic burdens, there are (1) the electric iron, (2) the electric vacuum cleaner, and (3) the washing machine. The fact that the washing machine is so inexpensive to operate is a point in its favor rather than a detriment.

Why should not the central-station salesmen in their house-to-house canvassing put in a friendly word for the washing machine? The trade in the vicinity could take care of the interest thus produced and effect the actual sales if the salesmen's time had to be concentrated on ranges, water and air heaters. It is said that where washing is done at home those who are more affluent than the average have real difficulty in obtaining domestic help for washing where there is no electric washing machine. This being the case, what more could be done to create good will for the electrical idea in domestic applications than to promote the washing machine actively?

A National Engineering Museum for the United States

THE recent visit to the Pacific Coast of Dr. Oskar von Miller, founder of the remarkable German National Museum at Munich and noted German engineer, has brought the subject of a National Engineering and Industrial Museum for the United States to the attention of many Western engineers for the first time. The movement for the establishment of such an institution for the preservation of historical and research material in technical fields is not new in this country—in fact there are incipient campaigns for two such organizations already under way, one contemplating the establishment of a museum in Washington, one in New York. This is an embarrassment of riches. There can be no objections to any number of technical museums established in different sections of the country for local use, but inasmuch as both these institutions now contemplated purport to be of national scope and look to national support for their establishment, there is little likelihood of either coming to realization while the other is in the field. The West, which has made history in many fields of engineering, will have much to offer such a museum when it is established and has a vital interest in where and how it is to be conducted. Western engineers should acquaint themselves with the situation and should aid in clearing the way so that the best of these projects actually may be put into effect in the near future.

Replace Obsolete Lighting Fixtures in Wired Homes

KITCHEN-LIGHTING campaigns have done more for the industry than add load to the lines of the power companies and result in business for the manufacturer, jobber and contractor-dealer. They have brought home the fact that the housewife is interested vitally in better home-lighting, and they have shown that many of the homes are equipped with obsolete lighting fixtures, not only in the kitchen but in practically every room in the house. As a result of recent studies it is estimated now that one-third of all ceiling lighting fixtures in the wired homes of the country are inefficient and out of date.

It would seem that here is an opportunity for every branch of the industry interested in better lighting. Particularly should the lighting fixture manufacturers and contractor-dealers give thought to the situation. With the interest created by the Home Lighting Contest still fresh in the minds of the public, the time seems ripe for a national "re-fixturing" campaign. At least the idea is worthy of consideration.

Indeed there is being talked in the East just such a follow-up next year, after the Industrial Lighting Activity has reached its full impetus and can go on of its own momentum. Such a plan should be a worthy successor to the Home Lighting contest of last year.

What's in a Name?

SOME communities grow in spite of the kind of newspapers they have; others because of them. In the latter category will be found the city of Los Angeles, not the least of whose attributes of greatness is the "Los Angeles Times," a real newspaper, that has courage, character, and the will to do things for the community it serves.

No better proof of courage could be offered than the line on its mast-head preceding the editorials. It reads "LOS ANGELES (Loce-Ahng-hayl-ais)". To brave the sharpened pencils of the "colyumnist", the paragrapher and the vaudevillian by thus flying in the face of the proletarian version of these two beautiful Spanish words, and to attempt to change the "Los Ann-jull-luss" of the man on the street into the liquid lisp of old Castile is a contract indeed.

What is the matter with the "San Francisco Chronicle"? Where is its vaunted enterprise, that it lets its contemporary on the south get away with this culture "complex?" What boots it if the Times has beaten the San Francisco daily to it? Let us have "SAN FRANCISCO (Thahn Frahn-thee-thko)", and then pass the idea along to the minority of the San Francisco Board of Supervisors and get them to offer a resolution or two about it. Adding the Castilian lisping "s" is a great idea, an evidence of a cultural "kink" that would make the "Loce Ahng-hayl-ay-noes" turn postively green with envy. Then, after this job is done, let us get to work on San Jose, Milpitas, Pajaro, Hueneme, San Joaquin and all the others. Californians, Inc., should look into this.

The Importance of Bookkeeping in Municipal Operation of Utilities

AT a recent municipal election in San Francisco a minority group of city fathers was returned triumphantly to office on the strength of a campaign for economy in city administration. The city tax rate was under fire, and so effective was the clamor that the "Economists" won out, the voters apparently failing to analyze the various items that went to make up the tax budget, most of it being obligatory due to action of the voters in authorizing bond issues for various purposes. Items contributing to the advance in the tax rate were increases in pay granted to the police, firemen and school teachers, all ordinarily having definite political value as popular moves.

Now come the platform men of the municipal street car lines demanding an increase in pay amounting to $1 per day per man. Thus the "Economists," pledged to lower the tax rate, find themselves in an interesting predicament. One supervisor advocated granting the increase and providing for future extensions of the lines by bond issues rather than from the somewhat nebulous earnings of the car lines. There was much fiery debate, the "buck," in the parlance of the street, being passed back and forth by opposing groups within the board.

Then came a real idea. It finally was suggested that action on the question be postponed until the "bookkeeping" system could be changed so that increases in pay could be granted from earnings. The depreciation item is to be subject to a capital operation, by which a reduction in the rate of depreciation will produce a corresponding increase in the "net" earnings, and thus provide additional profits from which the wage increase can be met.

Profitable municipal operation of utilities is really quite simple. It is merely a matter of bookkeeping.

DISCUSSION

Engineer Supplies Additional Data on Vaca-Dixon Substation

To the Editor:

Sir:—I note a short article on page 351 of the Nov. 1, 1925, issue of the Journal of Electricity describing the 40,000-kva. synchronous condenser recently installed in Vaca-Dixon substation. Permit me to correct the statements in the last paragraph.

The 1,810-hp. motor is not primarily a starting motor although it may be used for that purpose. Normal operation of the 40,000-kva. condenser is exactly the same in all respects as the two original 20,000-kva. condensers; that is, it is started from the 3,300-volt starting bus and comes up to speed in about thirty seconds, after which it is transferred to the 11,000-volt running bus. Approximately 16,000 kva. is required for starting under the above conditions.

The driving motor is used solely for line-testing purposes. With something over 600,000 kva. available at Vaca-Dixon substation under short-circuit conditions, the testing of the 110-kv. or 220-kv. lines after they have been relayed out imposes a severe duty on the oil circuit breakers. The 1,810-hp. motor is a variable speed motor which permits building up the voltage at reduced frequency and affords a flexible and convenient instrument for line-testing purposes. The motor will deliver an external load of 750 kw. for this purpose and requires approximately five minutes to bring the condenser from rest to a maximum of 700 r.p.m.

Your attention is also called to the fact that the condenser cooling air is conditioned by passing through an air washer furnished by the Carrier Air Conditioning Company of America.

E. A. CRELLIN,
Assistant Engineer, Division of Hydroelectric and Transmission Engineering.

SAN FRANCISCO City Hall. The fan effect shown in this picture was produced by lights on another building and is not a part of the permanent installation. The radio panchromatic fountains to the extreme left and right are permanent, though separate from the floodlighting. The volume of water is controlled by radio in synchronism with the music that is being received.

Details of Several New Floodlighted Buildings in San Francisco

By Roy N. Phelan

Associate Editor, Journal of Electricity

SEVERAL striking floodlighting installations which have caused considerable comment have been made in San Francisco. The three particular installations treated here are on buildings of distinct types, all of which are good subjects for floodlighting. These installations have many novel features which are particularly interesting to the electrical engineer and the contractor. Many of these are applicable to other installations in the Western states. This article describes them in detail.

FLOODLIGHTING has a great many applications, and this newly developed field of lighting is coming into use more and more. It has come into its own in several installations which are now in operation in San Francisco. Most important among these are the City Hall, the Pacific Telephone and Telegraph Company Building, and the Pacific Gas and Electric Company Building.

The City Hall installation was completed in time for the state's Diamond Jubilee celebration. The installation, however, is a permanent one of which San Francisco may well be proud. One of the features of the installation is the fact that all floodlighting units are installed on the building itself, making it unnecessary to depend upon other structures for light sources.

This is a highly desirable condition. However, in a great many cases this is impossible when it is desired to floodlight the entire building, because of the difficulty in obtaining suitable locations for the projectors.

Three revolving beacons are installed in the lantern at the top of the dome. These beacons are General Electric type CR-1 form A-6 revolving projectors with 1,500-watt lamps in each. Each one is revolved by an individual 1/16-hp. motor. A necklace of lights around the dome a short distance below the lantern consists of sixteen 100-watt clear lamps installed in weatherproof sockets.

A 100-watt lamp in a steel Ivanhoe angle reflector placed behind each window in the dome emphasizes these windows and produces a very pleasing result. A beautiful color effect is produced behind each urn at the base of the upper dome by the installation of a 200-watt lamp in an Ivanhoe reflector with a red glass cover. Similar colored lights also are installed in the wells at the base of the dome; a 100-watt lamp is placed in an enclosing globe 16-in. by 8-in. There are two of these units in each of the sixteen wells around the dome. The relative position of the various units may be seen in Fig. 1.

The dome proper is lighted with 113 General Electric L-9 projectors with 500-watt lamps in each. The octagon deck or base of the dome is lighted by 30 General Electric L-15 projectors with 1,000-watt lamps each. These are located in four banks installed at the four corners of the roof and four banks on the pediment roof. The four major banks in the corners of the roof consist of 26 L-9 projectors with 500-watt lamps and 6 L-15 projectors with 1,000-watt lamps. In back of these there are two 18-in. hand-control incandescent searchlights of the H.C.M. type with 1,500-watt lamps in each. The typical banks in the four corners of the pediment roof have two L-15 and two L-9 projectors. At the present time, however, the complete equipment is installed in but two of these corners; one has one L-15 and three L-9 projectors, and one has two L-9 and one L-15 projectors. In the near future all will have the typical grouping (see Fig. 2-B).

The searchlights are focused on the lantern and the spiral; the L-9 projectors are focused on the upper dome, and the L-15 projectors on the octagon deck or base of the dome.

An artistic color effect is produced on the colonnade facing Polk Street by the use of 42 L-9 projectors with 500-watt lamps in each. Two of these are installed in each bay.

The following is a summary of the equipment used in lighting the upper portion of the building:

113 L-9 projectors with 500-watt lamps	56,500	watts
30 L-15 projectors with 1,000-watt lamps	30,000	"
8 18-in. searchlights 1,500-watt lamps	12,000	"
3 24-in. beacons 1,500-watt lamps	4,500	"
16 reflectors (back of urns) 200-watt lamps	3,200	"
32 reflectors (wells) 100-watt lamps	3,200	"
16 lamps (necklace) 100-watt lamps	1,600	"

In lighting the colonnade:

42 L-9 projectors with 500-watt lamps	21,000	"
Total	132,000	"
Total floodlighting load	132	kw.

Floodlighting is one of the most effective, yet inexpensive forms of advertising. All costs used in this report are based on an average cost of $0.02 a kw-hr. for current and on a $2,500 a year lamp contract, which is an outside figure of the amount that would be paid for each of these items in any

building of the size described and does not take into account the cost paid by these particular firms. The installed capacity of the particular building would tend to reduce this figure in a large job.

132. kw. installed @ $.02 av. rate = $2.64 per hr. for current.

Lamp Costs

48	100-watt	lamps @	$ .50 =	$ 24.00
16	200-watt	lamps @	.80 =	12.80
155	500-watt	lamps @	2.00 =	310.00
30	1,000-watt	lamps @	3.75 =	112.50
11	1,500-watt	lamps @	9.00 =	99.00
				$558.30
				.71 (discount 29% on a $2,500 a year contract).
				$396.39 Net cost of lamp renewals.
				$ .396 per hr., cost of lamp renewals on a basis of 1,000 burning hours as the life of a lamp.

$2.64 per hr. power cost.
.40 per hr. lamp renewal cost.

$3.04 per hr. operating cost.

The floodlighting was laid out by H. E. Mahan under the direction of D'Arcy Ryan of the General Electric Company. The electrical installation was made by the Butte Electric & Manufacturing Company.

The Pacific Telephone and Telegraph Company Building

The 26-story building of the Pacific Telephone and Telegraph Company is distinctive, incapable of classification as typical of any style or school of architecture. It is an imposing structure that is an ideal subject for floodlighting. All floodlighting units are installed on the building itself and are concealed entirely from view from the street. Western Electric Davis projectors are used exclusively. There are 139 No. 1-W Western Electric Davis reflectors with 1,000-watt lamps, 33 PS-5 projectors with 500-watt lamps and 111 PS-2 reflectors with 200-watt lamps used in floodlighting the building, totaling 177.7 kw.

The first break in the contour of the building occurs at the nineteenth floor level and consists of a 20 x 20 ft. indentation at the southeast, northeast and northwest corners. In each of these are fourteen 1,000-watt units and five 200-watt projectors.

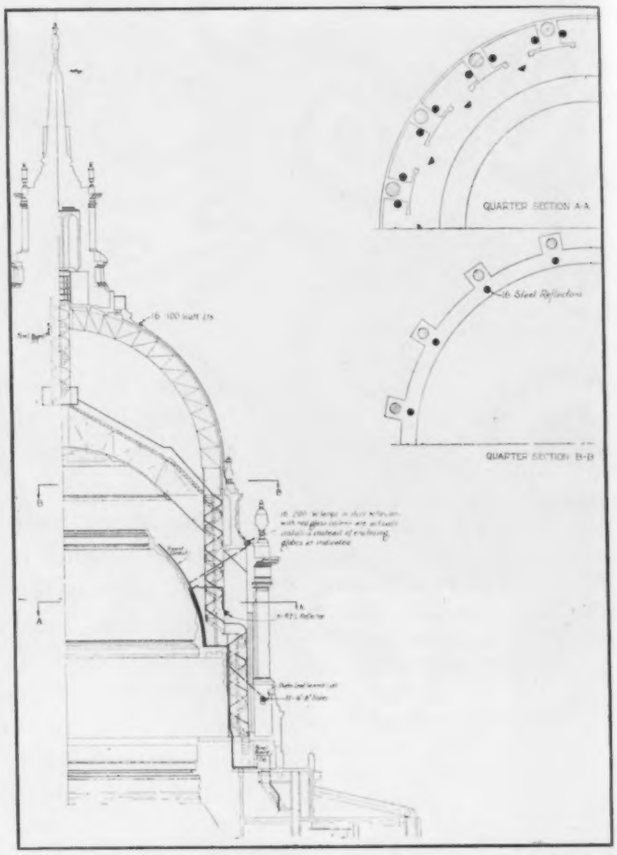


Fig. 1—Half elevation and two quarter sections showing arrangement of lights on City Hall dome.

These units light the two faces of the building in each of these corners from the nineteenth floor level up. The effect produced is decidedly pleasing, and from a distance it is hard to understand what produces the floodlighting with its straight lines of light at the corners without any light on other parts of the building at this level. This effect

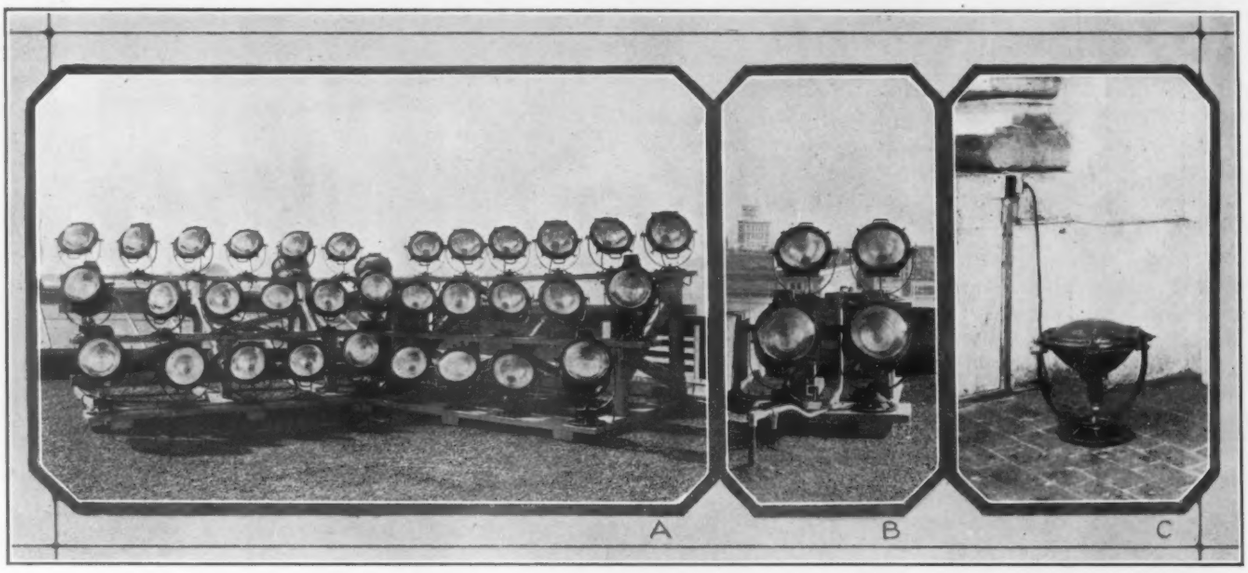


Fig. 2—Projectors on the City Hall. A. One of the four main banks which light the dome. B. One of the banks on the pediment roof. C. Two projectors like this in each bay light the colonnade.

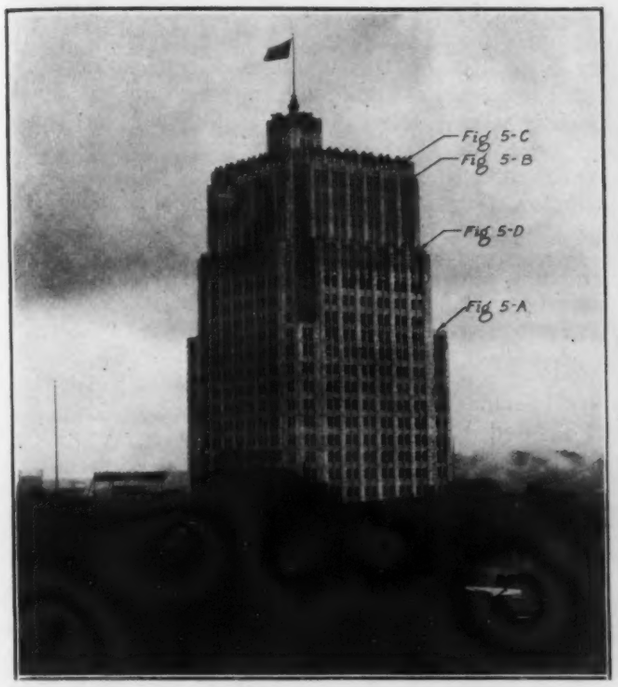


Fig. 3—The Telephone Building during the day.

Fig. 4—The Telephone Building at night.

may be seen in Fig. 4; Fig. 5-A shows a group of these units.

The east face from the twenty-third floor level up is illuminated from a bank made up of twenty-three 1,000-watt units and thirty-four 200-watt units extending over a length of 117 ft. The south face has nine 1,000-watt units and ten 200-watt units distributed over a distance of 38 ft. The north face has nineteen 1,000-watt and twenty-six 200-watt units over 104 ft. The west face seven 1,000-watt

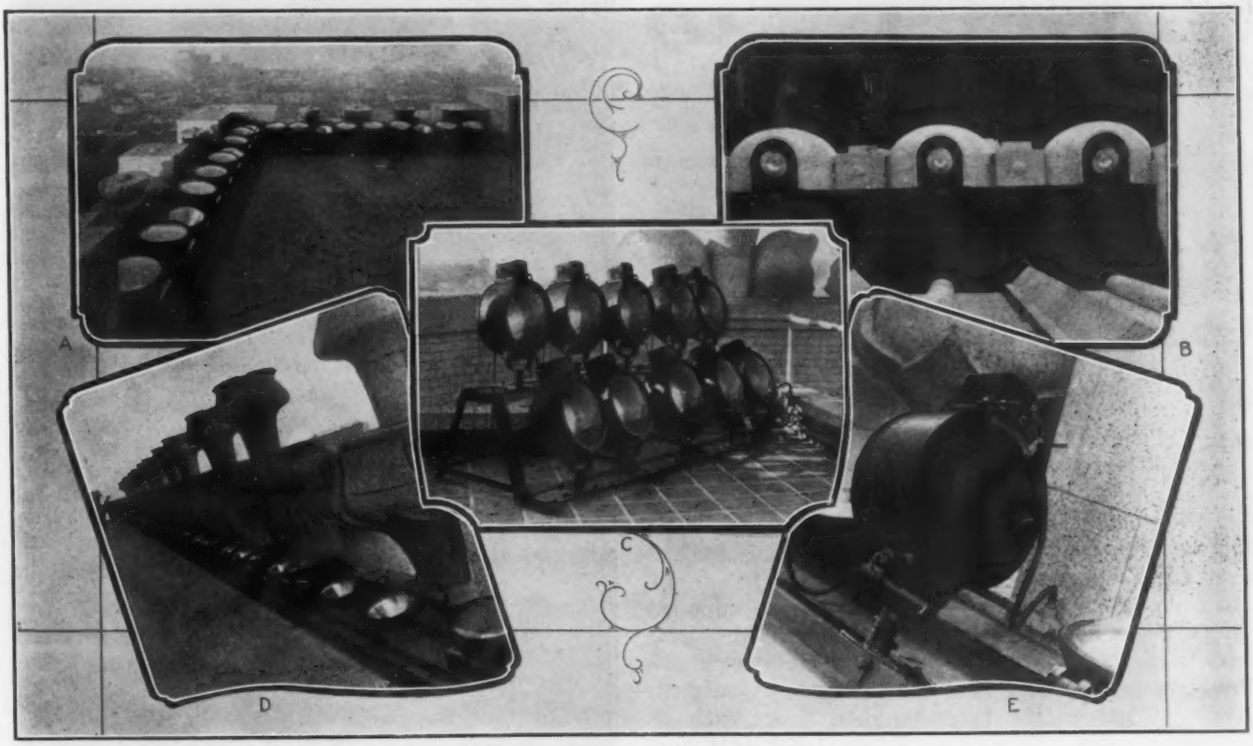


Fig. 5—Some of the projectors on the Pacific Telephone and Telegraph Company Building. A. One of the three banks at the nineteenth floor level which light the corners. B. Three of the thirty-three 500-watt units installed in the top of the urns at the roof-floor level. C. A bank of ten 1,000-watt projectors on the roof; these light part of the tower. D. This group of units lights the east face of the building from the twenty-third floor level up. E. A close-up view of one of the 1,000-watt units shown in D. Note the yoke with the adjustable legs which has replaced the handle, and the water-tight connection from the floodlight to the conduit.

and eight 200-watt units over 29 ft. Fig. 5-D shows the bank on the east face.

The 1,000-watt units in the flat banks have had the handles removed. Each handle is replaced by a cold rolled steel yoke with two adjustable legs. After being raised and returned to the original position, the projectors are not thrown out of focus; the friction clamp ordinarily used tends to loosen and each time it is moved the projector must be readjusted. This idea was developed by C. Felix Butte. This yoke may be seen in Fig. 5-E. A water-tight connection from the floodlights to the conduit is made by the use of Tirex cord and rubber packing gland, held in a conduit nipple with a conduit bushing. The units are held in their horizontal position on the rack by friction, being clamped to the framework with bolts. This permits them to be moved one way or the other in making adjustments.

The parapet extending around the faces of the building at the roof floor level has thirty-three 500-watt units recessed in copper cups in the top of the urns. These are distributed as follows: east face, 14; south face, 4; north face, 12; and west face, 3. Three of these are shown in Fig. 5-B.

The tower is lighted by groups of 1,000-watt and 200-watt units distributed as follows: south side, six 1,000-watt and four 200-watt units; east face, nine 1,000-watt and four 200-watt units; north face, six 1,000-watt units and five 200-watt units; west face, ten 1,000-watt units.

Fig. 5-C shows a bank of ten 1,000-watt units on the roof that light part of the tower. Two of the banks are double-decked like this one, and two are single-deck banks. The tower floodlights are located on the stairway roofs and the penthouse structure. The flag above the tower is lighted by means of four 1,000-watt units on the roof just below it.

Table I. Pacific Telephone and Telegraph Building Floodlighting.

Corners: Nineteenth floor to roof level throws.

Total lamps installed in the 3 corners	15	200-watts	
	42	1,000-watts	=45,000 watts
			10,338 sq. ft.
			4.352 watts per sq. ft.
Twenty-third floor ledges	78	200-watts	
	58	1,000-watts	=73,600 watts
			18,820 sq. ft.
			3.910 watts per sq. ft.
Roof level, four sides of tower and urns	14	200-watts	
	33	500-watts on urns	
	39	1,000-watts	=58,300 watts
			9,960 sq. ft.
			5.853 watts per sq. ft.

Flag, 4 1,000-watts

Average watts per sq. ft. = 176,900 ÷ 39,118 = 4.522 watts.

An 800-amp. circuit breaker is installed for controlling all floodlights. This circuit breaker includes sufficient capacity for lights for the south wing of the structure that will not be built until some future date. There are two floodlighting panels located on the nineteenth floor. These are supplied by two feeders, each separately controlled. Two feeders also are run to the twenty-third floor panels. One panel is located also on the twenty-seventh floor and one on the twenty-eighth floor; each of these has a separate feeder. Every 1,000-watt unit is on a circuit by itself, and the smaller units are grouped into circuits of 1,000 watts each.

J. R. Miller and T. L. Pflueger, and A. A. Cantin were the associated architects. Simonson and St. John, San Francisco, were the consulting electrical engineers for the building. Arthur Fryklund, lighting specialist of the Western Electric Company, San Francisco, assisted the engineers in the floodlighting work. The electrical installation was made by the Butte Electrical Equipment Company, San Francisco.

Following the same method of calculating the operating cost, as previously shown, its inexpensiveness readily is seen:

177.7 kw. installed @ $.02 av. rate = $3.554 per hr. cost of current.

Lamp Costs

139	1,000-watt	lamps @ $3.75	=	$521.25
111	200-watt	lamps @ .80	=	88.80
33	500-watt	lamps @ 2.00	=	66.00
				$676.05
				.71 (discount 29% on a $2.500 a year contract).
				479.995 net cost of lamp renewals.
				.48 per hr. per lamp renewal cost on a basis of 1,000 burning hours as the life of a lamp.

$3.554 per hr. power cost.
.48 per hr. lamp renewal cost.

$4.034 per hr. operating cost.

Pacific Gas and Electric Company Building

The Pacific Gas and Electric Company Building is floodlighted by using a combination of units installed on the building proper and on the roofs of buildings across Market Street and Beale Street.

There are sixty-three mogul No. 91-E X-Ray 1,000-watt wide-angle projectors used on the building, 27 units being on the fourteenth floor level and thirty-six on the sixteenth floor. On the fourteenth floor the units are installed on each side of the columns at their base. Those on the sixteenth

Fig. 6.—The Pacific Gas and Electric Company Building. The floodlighted tower to the left is part of the Matson Building.

floor are located on a balustrade which extends around the building; they are placed on approximately 7.5-ft. centers. An economic mounting was designed by C. Felix Butte who installed the electrical work. As seen in Fig. 7, it is made of sheet metal and holds the units in a vertical position.

There are sixty-two L-15 General Electric projectors installed on the roofs of buildings across the street. The Market Street bank is made up of

Fig. 7—Projectors installed on the balustrade extending around the Pacific Gas and Electric Company Building at the sixteenth floor level.

36 projectors while the bank on Beale Street contains 26. The bank on Market Street is divided into three groups of 12 projectors each, and each group is controlled separately for convenience; any or all three of the groups may be lighted at any one time. On the Beale Street side a similar arrangement is made using 10, 8 and 8 projectors. Remote-control switches are installed at each bank and also in the building so that they may be controlled from either place. Attachments have been made so that color screens may be used for special occasions.

The roof structures are particularly noteworthy in that they do not add any additional weight to

Table II. Pacific Gas and Electric Company Floodlighting.

Fourteenth floor	26	1,000-watts	26,000 watts 8,512 sq. ft. 3.05 watts per sq. ft.
Sixteenth floor	37	1,000-watts	37,000 watts 7,400 sq. ft. 4.9 watts per sq. ft.
Market Street side on roof opposite building	36	1,000-watts	36,000 watts 18,225 sq. ft. 1.97 watts per sq. ft.
Beale Street side on roof opposite building	26	1,000-watts	26,000-watts 12,060 sq. ft. 2.15 watts per sq. ft.
Average wattage total			125,000 watts 60,137 sq. ft. 2.07 watts per sq. ft.

the roof of the building. The bolted frames of these structures tie in to the steel frames of the columns of the existing building and the firewalls. All are bolted instead of being riveted because of the indefinite length of time that they may be allowed on any building. By being bolted, they can be dismounted and moved to another position; these frames are very rigid.

The units across the street never are pointed lower than the fourth floor because of passersby seeing them, which would tend to kill the desired effect. In this particular installation about 10 foot-candles of illumination are projected on the face of the building.

Following the same method of calculating the operating cost, it may be seen what inexpensive advertising is secured by floodlighting.

125.0 kw. installed @ $.02 av. rate = $2.50 per hr. for current.
125 1,000-watt lamps @ $3.75 = $468.75
.71 (discount 29% on a $2,500 a year contract).
$332.81 net cost of lamp renewals.
.33 per hr. lamp renewal cost on a basis of 1,000 burning hours as the life of a lamp.

$2.50 per hr. power cost.
.33 per hr. lamp renewal cost.

$2.83 per hr. operating cost.

Bakewell and Brown, San Francisco, were the architects and Hunter and Hudson were the consulting electrical engineers on the building. The electrical installation was made by the Butte Electrical Equipment Company.

General

Discussion of these jobs brings out several general conditions which are applicable to most floodlighting jobs. Every precaution should be taken to prevent moisture from penetrating the projectors. When it is necessary to place projectors on the roofs of other buildings, the subject of roof structures and their rentals must be considered. It is most important to have roof structures so located that it is impossible to see the projectors on them from the street.

The intensity to which the area should be illuminated depends almost entirely on two things: the color of the floodlighted area or object and the brightness of the surroundings. The con-

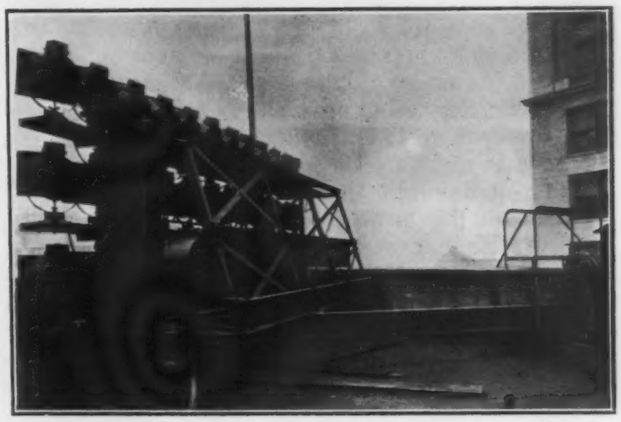


Fig. 8—There are thirty-six 1,000-watt projectors installed in this bank across Market Street from the Pacific Gas and Electric Company Building. Note the ruggedness of the roof structure which does not add any additional weight to the existing roof.

dition to be sought in floodlighting is to have the floodlighted object or area bright enough to stand out in relief against the surroundings.

Floodlighting is good business for the entire industry aside from the benefits derived by the community in an improved appearance of its buildings.

Electricity Driving Longest Railroad Tunnel in United States

By C. H. Vivian

Boulder, Colo.

THE Moffat Tunnel through the Continental Divide near Denver is being driven by electricity in record time. Through the use of synchronous motors a load factor of 95 per cent is maintained with a monthly consumption in excess of 500,000 kw-hr. One of the features of the job is the use of electric mucking machines to remove muck from the tunnel.

ELECTRICITY is furnishing the power to drive the longest railroad tunnel in the United States through the Continental Divide in Colorado, forty miles northwest of Denver. The bore, known as the Moffat Tunnel, will traverse six miles of granite and allied igneous rocks at an altitude slightly above 9,000 ft. It will be used primarily for rail facilities, though provisions are being made for the transportation of automobiles through it. An auxiliary tunnel which is being used as an aid to construction will be utilized to carry irrigation waters from the western slope to the eastern slope of the range. The supply eventually will contribute to the domestic distribution system of the city of Denver.

It is a singular fact that the same mountains that are being tunneled are furnishing the energy that is driving the drills. Waters from the melting snows in close proximity to the east portal of the bore are harnessed at the Boulder Canyon plant of the Public Service Company of Colorado to create the power which is transmitted back up and across the hills to motivate the machinery that is gouging a shaft of daylight through the rocky barrier.

Work on the project was started in September, 1923, under a contract calling for completion in forty-six months. With less than half of this period elapsed, however, progress has been made which indicates that the workmen will "hole through" during the summer of 1926 and will put the finishing touches on their task several months in advance of the time set.

The operation is essentially one of hard-rock mining. The prinucipal features are drilling, blasting, removal of the excavated material and timbering.

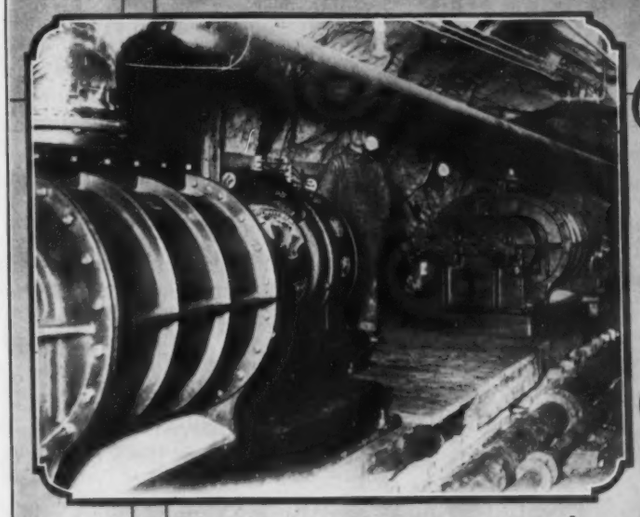
Electric power is used exclusively and has been one of the leading factors in enabling the working crews to shatter repeatedly world's records for progress and economy. Unless something unforeseen occurs, it is certain that the total elapsed construction time will be not more than forty months. Comparison of this period with the time required for completion of similar projects over the world serves to emphasize the speed of the present operation.

The Mont Cenis Tunnel between France and Italy, 7.6 miles long, required thirteen and one-half years to build. The Hoosac, between Troy, N. Y., and Greenfield, Mass., 4¾ miles long, was started in 1855 and opened in 1876. The St. Gotthard, in Switzerland, 9.3 miles long, required nine years to complete. The Simplon, between Switzerland and Italy, 12.3 miles long, was constructed in seven years. The Rogers Pass Tunnel on the Canadian Pacific line established a world's record for advance. However, average monthly figures made there are being eclipsed in the Moffat Tunnel despite the fact that the greater size of the Rogers Pass project permitted speedier handling of the rock.

The Moffat Tunnel will enter the Continental Divide on the east flank of the range at an elevation of 9,187 ft. above sea level. From that point it will rise on a gradient of three-tenths of one per cent to the center, which will have an elevation of 9,241 ft. Then it will drop on a gradient of nine-tenths of one per cent, emerging on the west side at an altitude of 9,085 ft.

Construction is being carried on simultaneously from both sides of the range where towns known as East Portal and West Portal have been established. The pilot bore, commonly known as the water tunnel, parallels the main tunnel at a distance of 75 ft. to the south. By cross-cutting from this to the main line at intervals of approximately 1,500 ft. the actual problems of construction are simplified greatly.

The pilot bore is theoretically 8 ft. by 8 ft., although for facility of construction it is being made approximately 9 ft. by 9 ft. On the same level with this water tunnel an advance heading of similar size is being driven in the center of the main bore. From this central opening excavation to full size, 16 ft. wide by 24 ft. high, subsequently is effected. At the west end, because of the soft and broken character of the rock for the first 7,000 ft., this plan of operation had to be varied somewhat.



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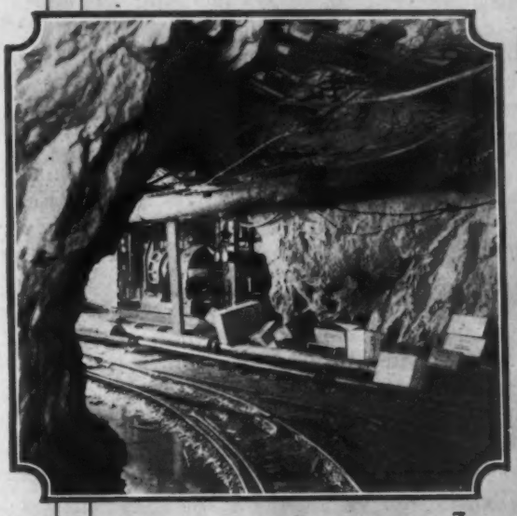

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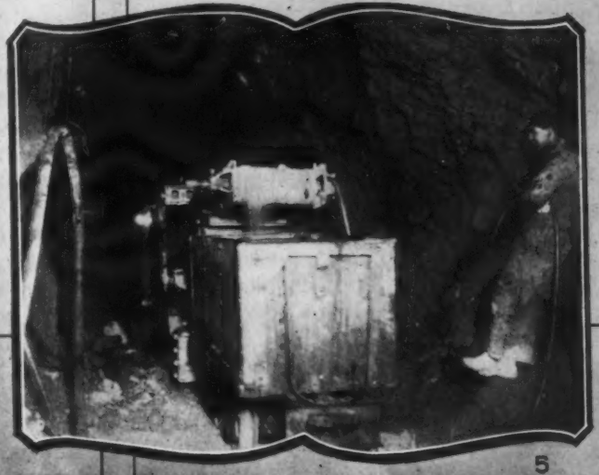

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IN driving the Moffat Tunnel under the Continental Divide west of Denver electricity plays an important part. Ventilation is one of the major problems. No. 1 shows two motor-driven Roots blowers inside the tunnel. No. 2 pictures the electric locomotive David H. Moffat, named in honor of the projector of the tunnel. Storage battery and trolley locomotives are used for hauling muck from the tunnel. No. 3 shows one of the many motor-generator sets in use. No. 4 is a view of the outdoor substation at the West Portal. The line which brings energy to the tunnel crosses the Rockies at an elevation in excess of 12,000 ft. No. 5 shows one of the electric mucking machines which have aided workers in making many records.

The general plan there was to drive the advance heading at the top of the center line of the completed bore. It then was excavated to full width, and after that the bench of 16 ft. was removed. With both headings now in solid rock, however, the original plan is being followed closely.

All labor crews and material for advance heading work in both tunnels go in through the auxiliary bore, and all muck is removed by the same route. All air and water lines also are carried in the smaller tunnel.

The power is delivered by transmission line to outdoor transformer stations at each base of operation in the form of 3-phase alternating current at 44,000 volts and 63 cycles. This is reduced to 2,300 volts and subsequently rectified by underground synchronous motor-generator sets to provide 250-volt direct current for operating electric locomotives, air blowers, fans, mucking machines, and so on. The synchronous motors are excited so as to keep the load power factor at about 95 per cent. For the lighting circuits of the tunnels and camps the voltage is cut down to 110 volts by suitable transformers.

The total power used amounts to between 500,000 and 600,000 kw-hr. monthly. The contract with the Public Service Company of Colorado was drawn on a basis of 1,000 hp. demand. The schedule of rates, providing for charges upon the total requirements and average use during a month of 730 hours, is as follows:

Demand	Average Use During Month	Total Bill per Month	Per hp. of Demand per Mo.
1,000 hp.	500 hp.	$3,665	$3.665
1,000 hp.	625 hp.	4,055	4.055
1,000 hp.	750 hp.	4,361	4.36

The power generated by two 7,500-kw. impulse-type turbines operating under a 1,870 static head of water which is impounded at Barker reservoir near Nederland and transported 12 miles through a 36-in. pipe line to Kossler Lake at the rim of the canyon above the plant.

The transmission line, carried on wooden poles across 30 miles of rough country to East Portal, was constructed in 120 days. From East Portal to West Portal the line crosses the divide by the shortest possible route. It is nine miles in length and reaches an elevation of approximately 12,050 ft., making it one of the highest lines of 44,000 voltage in the country.

Maintenance of this line in winter calls for resourcefulness and hardihood. Gales of 60 to 90-mile velocity pack the snow into deep drifts, while temperatures of 50 deg. below zero are not uncommon. At certain points on the line drifts reach to the crossarms of the 35-ft. poles. On one occasion an Italian laborer walked into one of the wires and was electrocuted. Wires often are buried in the snow, but because of the dryness of the precipitation there is little trouble from this cause. Patrols are called upon constantly to remove weighty sleet from sagging lines. Despite the apparent obstacles in connection with maintenance, total outages since work started have been less than 20 hours.

Compressed air is the motive force employed in the actual drilling, in a large part of the excavating and loading, and for ventilation. Naturally great amounts of it are required. At East Portal the compressor plant consists of three large machines and one small one, and at West Portal there are three large units. These deliver a combined supply of approximately 8,000 cu. ft. of air per min. at 100 lb. pressure. The larger units are driven by 200-hp. motors and the smaller machine at East Portal by a 75-hp. motor. All are of the synchronous type.

The high-pressure air is carried underground in an 8-in. main, from which feeder lines run to the various points of use. Drilling at the advance headings is speeded by a specially designed drill carriage which enables four machines to work at the breast at the same time. This is mounted on railway trucks, allowing it to be moved back when blasting is being done. The average time required for drill set-up is 15 min.

Twenty-four holes constitute a round. They have a penetration of 8 ft. In actual practice each round of holes breaks about 28 cu. yd. of rock, using approximately 7 lb. of 60 per cent dynamite to the hole. The resultant progress is about 7½ ft. to the round. Delay primers are used in blasting, a wedge at the center of the drilling breast being broken out first, allowing the remaining holes to break against an open face.

The drilling and mucking crews alternate in the advance headings of the railroad tunnel and the pioneer tunnel. Mucking, or loading, is done mechanically, a Conweigh electric mucking machine being used for this purpose. It is driven by a 50-hp. motor, current for which is obtained by tapping the 250-volt trolley line with a water-proof cable which is laid on the ground up to the point of use. The mucking machine, which consists of a gouging dipper which dumps backward onto a belt conveyor, will fill a 50-cu. ft. car in 90 sec. In actual practice about fourteen cars are loaded to the hour.

Ventilation is provided by electrically operated blowers and fans. These are located just short of the crosscut nearest the advance heading in the pilot tunnel, being moved up after each new crosscut is driven. Duplicate blower plants are provided for auxiliary service. Each of these is driven by a 100-hp. motor and delivers 8,000 cu. ft. of 4-lb. pressure air per min. The fan, driven by a 10-hp. motor, delivers 12,000 cu. ft. of air per min. A line from the blower goes through the crosscut to the advance heading of the railroad tunnel. A bulkhead is erected across the pilot bore just in front of the blowers and fan, and all crosscuts but the most forward one are bulkheaded. These structures circulate the fresh air to the advance headings, and the stale air goes out through the main tunnel line. The ventilation is such that the mucking crews can work comfortably at the tunnel breasts twenty minutes after a round of shots is fired.

For work in the advance headings where trolley cannot be maintained 85-volt storage-battery locomotives are used. These are geared for a maximum speed of 3½ miles an hour, and each is capable of

exerting a drawbar pull of 1,000 lb. The storage batteries are charged at stations adjacent to the compressor plants at each portal, special apparatus being provided for handling them.

These locomotives switch the empty cars to the headings and handle the loaded cars back as far as the trolley. There they are picked up by the 4-ton trolley locomotives and made into 12-car trains for haulage to the portals. Oustide they are dumped into larger cars to be taken to the dump. All track in the pilot tunnel and advance heading of the railroad tunnel is 24-in. gage. So well co-ordinated are the various steps in the operation that all rock is on the dump four hours after it is shot down in the advance headings.

Enlargement of the advance heading to the full sized 16 x 24-ft. railroad tunnel is effected by means of radial or "ring" drilling. Each set of holes is spaced 4 ft. apart and drilling is done 200 ft. in advance of the firing. Ordinarily from three to five rings are shot at a time, using delay primers so that each ring breaks against an open face. Approximately three pounds of 60 per cent dynamite are used for each cu. yd. of rock broken.

At East Portal an air shovel operating at 100 lb. is used for loading the broken rock. A similar shovel recently was supplanted at West Portal by a St. Joe electric loader driven by a 100-hp. motor.

An advance of as much as 20 ft. a day is easily possible in the enlargement work at each end. The muck is handled in 4-cu. yd. steel cars. These are hauled to the outside by 8-ton, 250-volt locomotives running on 36-in. gage track. Each locomotive working in the enlarged tunnel is equipped with a reel carrying 500 ft. of power cable, which extends the range of operation beyond the point where trolley can be maintained.

At East Portal there is an outside crushing plant which is treating a portion of the excavated material for ballast use. The electrical equipment there consists of a 50-hp. motor on the crusher and 25-hp. units on the hoist and screening plant.

The tunnel is rich in historical background and represents the fulfillment of a dream by David H. Moffat, mining man and empire-builder of Colorado. Opposed by the large railroad interests, Moffat placed his entire personal fortune into the railroad which now bears his name to provide a short line across the Rockies. Because of expediency at the time he built his line over the divide, though he intended to construct the tunnel later.

Moffat died in 1911 while in New York attempting to finance the further construction of his road. Since his death the line, completed from Denver to Craig, Colo., near the Utah line, has had its stormy days and is now in the hands of a receiver.

In 1922 a special Colorado legislature created the Moffat Tunnel District, consisting of Denver County and other counties traversed by the railroad. Bonds in the sum of $6,720,000 were authorized to build the tunnel, and after the measure was declared legal by the supreme court work was begun immediately.

The tunnel will eliminate 23 miles of 4 per cent track and 11,000 deg. of curvature. It will reduce the climb over the divide by 2,406 ft. of elevation. The road at present crosses Rollins Pass at an altitude of 11,660 ft. High winds sweep the snow onto the track there to such depths that for days at a time in winter traffic is often at a standstill. It requires four of the most powerful locomotives known to haul a 22-car freight train over the highest portion of the pass at present. Snow-fighting has been responsible for 41 per cent of the total operating expenditures in the past.

Upon completion of the tunnel and the construction of a 42-mile connecting link between the Moffat road and the Denver & Rio Grande Western system in western Colorado, the running time between Denver and Salt Lake City will be reduced by several hours. The road also will open a vast empire of natural resources in western Colorado, which has been retarded because of inadequate rail facilities.

The tunnel project is being administered for the district by a commission. The contract was let to Hitchcock & Tinkler on a profit-sharing basis, with $5,250,000 as the basic price. This firm has constructed over fifty tunnels in all parts of the world, including one for the San Joaquin Light & Power Corporation near Fresno, Calif. R. H. Keays, engineer on some of the tunnels for the city of New York, is directly in charge of the work for the commission as chief engineer. C. A. Betts is office engineer at Denver. A resident engineer is maintained at each portal.

The tunnel commission provided all equipment and structures. The camps at the two portals are models of sanitation and convenience. Because of the excellent conditions, a minimum wage of $4.50 a day, and a bonus system whereby the drilling and mucking crews in the advance headings increase their earnings considerably each month, the labor turnover is very low for a project of this type.

Owing to the difficulties encountered with soft rock at West Portal in the early operations, heavy timbering is required there in the completed section. This will make the project more costly than was estimated. However, all indications are that a new record will be set for expense per foot. The total excavation called for is approximately 600,000 cu. yd.

Operation of trains through the tunnel will be by electricity. In fact, it is possible that adjacent sections of the railway also will be electrified. Several firms have prepared complete data on both plans for submission to the tunnel commission.

Colorado Factions Must Agree Quickly.—Reports from Washington are to the effect that unless those who opposed granting of the Girand license on the Colorado at Diamond Creek can come to an agreement among themselves, the Federal Power Commission will not wait longer to give its decision. It is felt by the commission that if there is any danger to the upper states from development on the Colorado River, it will be due to some big storage project such as that at Boulder, and not to one whose purpose is merely to gain head, such as that of Girand. Applications on the Gila River also are being held up by the delay on the decision.

Some Facts About and Some Thoughts On Electric Water-Heating

By Millard Sebern
Assistant Manager, Washington Electric Supply Company, Spokane

ELECTRIC current first was sold intensively in the home for lighting purposes, primarily because every home uses light. Later a multitude of household uses for electricity was developed, and a great deal of time and energy has been expended in aggressive sales campaigns on washing machines, vacuum cleaners, and other devices; but the electrical industry has given at best only a more or less hit-and-miss thought to water-heating.

The water-heating load taken onto the lines of utility companies thus far has been largely in connection with range load, and has been the outgrowth of a desire on the part of the companies to provide, as an added impetus to range sales, an all-electric kitchen from which all other types of fuel have been removed. Now if it is true that every home uses light, it is likewise true that every home uses hot water, and if hot water service can be supplied at a price that is satisfactory to the service company and to the customer, a large business can be developed—a business profitable in itself, whether a range is used in connection with the water heater or not. It is necessary, however, to consider a few basic facts in connection with determining the kind of a heater to sell and the rate to charge for the service.

The problem of changing kilowatt-hours into hot water is simple in the abstract, but the fact must not be lost sight of that the electric water heater will be required to work more hours per day than any other electric heating element in the home. It is obvious, therefore, that if the electric water heater is to be a long-lived device, giving satisfaction to the customer and a minimum of trouble to the serving company, the heating element must operate at a low temperature, preferably under 400 deg. F., in order that burn-outs may be kept at a minimum.

Types of Heaters and Radiation

Water heaters developed up to the present time may be divided into three types: insert, clamp-on and circulation. The efficiency with which heat is transmitted from heating unit to water in the case of any of these types is of little importance because it is neary 100 per cent in any case. But the transmission of heat to water is only the first step. The most important consideration is to keep the heat in the water until the customer uses it. The radiation loss from a bare 30-gal. tank at 100 deg. above room temperature for thirty days is, by actual test, 450 kw-hr. Range-boiler covers have been developed that will reduce this loss to 90 kw-hr. The comparison of these two figures makes it plain that, whether a storage or intermittent system is used, if electric water heating is to be a success, range boilers must have the best insulation possible.

Inasmuch as radiation losses are one of the greatest drawbacks to economical water-heating, it is fundamental that these losses must be kept at a minimum. In order to do this the tank must have an efficient covering and the heater must be of such a type as can be installed entirely within the range-boiler cover. This is essential because, if heaters are installed outside the range-boiler cover, additional radiation surface is added, that will, of course, reduce the amount of hot water the customer will receive for the kilowatt hours consumed.

Further, it is desirable that the water-heater be of such type as can be installed at the least expense to the customer for the original installation, and as may be repaired or replaced at the least cost in case of burn-out of the element or of trouble with the plumbing.

In summing up the foregoing these basic facts must be acknowledged: that the element of the water heater must operate at a low temperature to insure long life; that the range boiler and piping must be covered with a highly efficient insulation to reduce radiation losses; that the surface area of radiation must be kept at a minimum, preferably no larger than the range boiler; and that the heater must be easy to install and easily accessible in case repair or replacement is necessary.

Sizes of Heaters and Load Factors

There is a great difference of opinion as to the correct size of water heater that should be used. A recent survey in California shows that of 7,183 heaters used, 4,945, or more than sixty-nine per cent, are either 4-kw. or 5-kw. heaters. The report shows further that where continuous automatic service is supplied an average monthly consumption of 574 kw-hr. is required, while in installations where the water is heated intermittently as needed an average consumption of 210 kw-hr. is used. These figures lead to some interesting deductions as to the load factors of the different kinds of installations. Using the above figures, it is found that where continuous hot water is supplied automatically, a 4-kw. heater has a load factor of twenty per cent, and a 5-kw. heater sixteen per cent. Where the water is heated intermittently with an average monthly consumption of 210 kw-hr. the load factor of a 4-kw. heater is 7.4 per cent, and a 5-kw. heater 5.8 per cent. The question arises, "Are these low load factors desirable from the service company's standpoint?"

A recent investigation in the Northwest shows that of the heaters sold by one power company that supplies low-wattage, constinuously operated heaters, ninety per cent were of 750-watt capacity or less. This proves that continuous hot water is

being supplied with low-wattage heaters with a monthly consumption of 540 kw-hr. or less, and this with a load factor of 100 per cent. Taking from the California report the average monthly consumption of 574 kw-hr. where continuous hot water is supplied, it is seen that this service could be provided with an 800-watt heater with a 100 per cent load factor. It should be borne in mind that a low-wattage, continuously operated heater, when selected with reference to the family concerned, means **instantaneous** hot water from storage while the comparatively low temperature at which the heater operates means **long life.**

Relation of Load Factor to Peak

The peak-load problem is always one of the main problems of operating companies. Peak loads in the case of household devices usually are caused by habit or necessity. The highest peak on range load occurs between 4 p.m. and 7 p.m., and is caused by the preparation of the evening meal. It is also true that during the period of preparation of the meal and washing the dishes hot water will be used, and this means a water-heating peak will occur at the same time as the range peak. This water-heating peak will be in direct relation to the size of the heater. This condition is undesirable, of course, and the harmful effect of it can be minimized only by using low-wattage heaters with a high load factor. There are two towns in the Northwest where the water-heater saturation is fifty per cent. The heaters in these towns are all of the low-wattage, continuously operating type. Were they of the high-demand type, to perform the same service the operating company would be compelled to increase materially its distribution system to handle the peaks.

Rates

There is a great difference in water-heating rates in different localities, but one thing is certain, namely, that, if electric water heating is to be a success, the rate must be satisfactory to the customer and the serving company. So-called "flat rates" are really not flat rates, since the wattage of the heater is known and the maximum number of hours of use is known, and with these known quantities it is easy to calculate the rate per kw-hr. In considering a low rate per kw-hr. for water heating, either metered or a so-called "flat rate," is it fair to segregate this from the rates for lighting and cooking? Or should this low rate for water-heating be considered as the lowest rate in the block and the return per kw-hr. be figured accordingly on the entire consumption of the customer?

It is perhaps not necessary to state in conclusion that this is not intended as an exhaustive treatment of the complex subject of electric water-heating. It is an attempt only to set down a few fundamental facts and draw some conclusions therefrom on certain phases of the subject. The writer realizes that there is a wide divergence of opinion as to some of the problems presenting themselves in a study of water-heating, and it is with the thought in mind that often ideas are crystallized and effort concentrated by an exchange of opinion that he presents the foregoing material.

Ag Club Boys See Demonstration of Electrical Phenomena

By Ben D. Moses
University Farm, Davis, Calif.

"WHAT is electricity?" This question was asked of 700 boys in attendance at the annual convention of Agricultural Clubs at the University Farm, Davis, Calif., this fall. None had ever seen electricity, none had heard it, none had tasted it, but many loudly proclaimed that they had felt it. This seemed to be a good time to show the Electrical Brownie, ready to serve them with heat, light and power, and "Johnny Kilowatt," a sprightly elf with a genial smile, was introduced. "He" bore a glowing heating element in "his" right hand, a whirling electric fan in "his" left hand, and wore an incandescent lamp in "his" cap. "Thank you, Johnny, for your visit. I hope you will come in as we need you a little later on," brought a nod and "Johnny" retired.

With this introduction, Professor Fletcher of the Agricultural Engineering Division proceeded to demonstrate that electricity can be recognized, not by its appearance, size, shape or other tangible physical properties, but by the phenomena accompanying its passage through a conductor. That a wire carrying an electric current behaves very much like a magnet was demonstrated by the development of solenoid consisting of a simple helical coil of wire wound about an iron core. Experiments with this miniature electric crane then followed; pliers, screwdrivers, and scraps of iron were picked up, transported and dropped on simply closing the circuit by touching the wires and then opening it by separating them.

A heavy induction coil energized by the current from a 32-volt storage battery then was used to magnetize a boy's knife "right through his hand and it didn't hurt a bit."

One of the smaller boys next was asked to hold two bare copper wires, which he did without any inconvenience to him, but much to his surprise and to the amusement of the rest of the boys, he lighted a lamp by touching the two terminals. This demonstration served to explain that unless the voltage is high enough to overcome the resistance of the body no current will pass and consequently there will be no sensation of shock.

"Johnny likes to run through the wire," the boys were told, "but he has more trouble through small wires than large, and his path must be unbroken. When lots of these little Johnny Kilowatts are forced to pass through a wire that is very small they crowd each other and rub elbows so hard that they heat it up." To illustrate how the size affects the "heating up," a frame containing various sizes of wire was used. These wires all were connected to one side of a 110-volt light circuit, a movable wire connected to the other being used to direct the current through the different wires in succession. The large wire was sufficiently large and "Johnny" had no trouble passing through, but his troubles began as the wires became smaller; the smaller the

wire the more trouble he had and the hotter it became till finally he burned the smallest in two.

A small three-phase induction motor with the upper half of the stator removed and the circuits completed in the lower half made a very nice demonstration of the method of operation of the squirrel-cage type of motor. It was rather surprising to see a motor with the top half cut away actually run, and even when two phases were cut out by opening up one wire the motor still ran as a single-phase type. It was quite easy to demonstrate that, with all three phases in, the motor would run in one direction only, and that by simply interchanging any two wires the direction could be reversed. "Johnny" made quite a bit of noise when the motor ran single phase, due to the transformer action, and his presence was indicated not only by his turning the rotor but by his "growl." Of course when operating as a single-phase motor it ran equally well in either direction, depending upon how it was started. Considerable amusement was caused by starting the motor and running it on one phase, then by throwing in the other two phases hear "Johnny" growl, see the rotor slow down, stop, and then of its own accord run in the opposite direction.

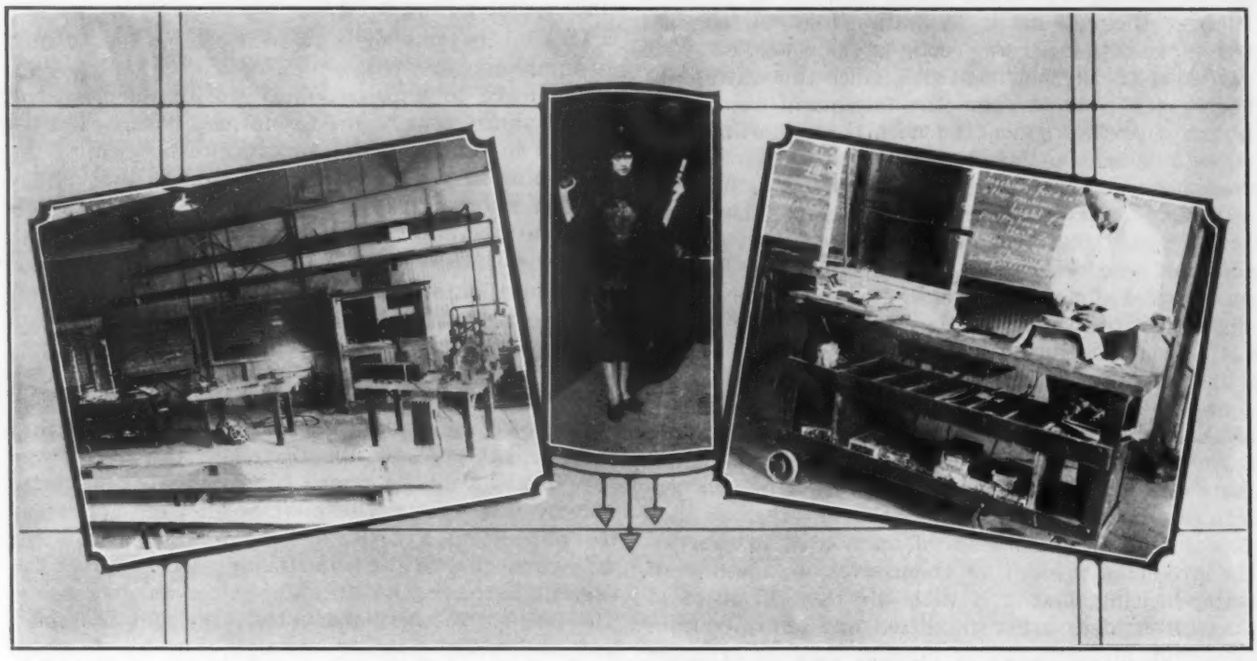
The morning's demonstration was brought to a rather spectacular climax by the frying of a hot cake through a newspaper without burning the paper. It was stated that a newspaper was somewhat more effective than an ordinary piece of paper because of the "hot advertisements." It was stated also that there was nothing mysterious about this paper, that in common with all newspapers there was "nothing in it," but "Johnny" was going to work in the box covered by the paper and would try so hard to get out and raise such a fuss that he actually would heat the frying pan and not damage the paper. The apparatus used in this experiment consisted of a heavy induction coil covered over with a wooden box, a newspaper, an aluminum frying pan and necessarily some cake batter.

When the coil was connected into a 220-volt a.c. circuit the eddy current set up in the flat bottom of the pan caused it to heat up. "Johnny" growled vigorously when the frying pan was put in place and the closer the pan the louder he growled. The metal of the pan being aluminum, there was no magnetic effect and the induced field set up served to repel the pan rather than to attract it. This jumping away of the frying pan caused much amusement among the spectators. A second coil of smaller proportions with a 32-volt lamp connected into the circuit being brought into the field of the other resulted in sufficiently strong transformer action to light the lamp.

"How can you fry a pancake through a newspaper?" and "How can you light a lamp without any electricity?" were questions left to be something of a mystery for the boys to work out. They were told, however, that the same "Johnny Kilowatt" that was frying the cake, that lighted the lamp, heated the coil and ran the fan was the same "Johnny Kilowatt" that magnetized the knife and picked up the pliers.

To prove the connection between the stove which would not burn the newspaper and the electromagnet, iron filings were dropped on a glass cover placed over the induction coil and immediately formed bristles standing on end that would lie flat when the current was turned off and spring into shape when the switch was closed. Not only was it possible to grow hair on the glass, but "Johnny" seemed to work equally well through paper or a board.

A table containing many other appliances, such as a radio equipment, battery, electric rodent destroyer, electric bells, fans, heaters, and so on was used to show how useful "Johnny Kilowatt" can be.



General view of laboratory where demonstrations were made (left). Johnny Kilowatt (center). Demonstrating to the boys how eggs can be fried through a sheet of paper (right).

CENTRAL STATION CONSTRUCTION OPERATION AND MAINTENANCE

Substation Operators Are Systematically Trained

Definite Instruction Program, Care in Selecting New Men, and Accurate Service Records Make for Efficiency

By L. L. DYER, Superintendent of Substation Operation, Southern California Edison Company, Los Angeles

Substation operator:—the man who can operate and maintain his station in such a manner as to deliver continuous service to the company's consumers.

In an organization where a great many such operators are required the best results usually will be obtained by starting with raw material. Bright young men who have had at least high school education or its equivalent are more easily moulded to fit requirements. A man who has been trained elsewhere is inclined to hold back on the grounds that, "We didn't have to do it that way back in Iowa."

In interviewing a prospective employee, after deciding that he is good material, it is clearly explained to the prospect that much will be required of him in hard work and study. He is told that for the average young man of today, the road seems hard and stony, but that there really is a pot of gold at the end of the rainbow for him who will apply himself. The educational course designed for the operators is outlined to the prospect, and the general policies of the organization are gone over.

After passing the medical examination the embryo operator is ready to be sent to his first station. This station is manned by a chief who has proved his ability to carry forward the policy of the department. He is capable of developing men and of inspiring in them a desire to learn more about their jobs in preparation for the positions higher up, as well as filling the one he holds a little better than anyone else.

Here the prospective operators are given their first taste of some of the more menial tasks that are an operator's lot, such as hoeing weeds, cutting lawns and other similar and necessary work. One young man upon arriving at one of these schooling stations observed two of the operators rolling the lawn with a large roller. He asked the chief if that was operators' work and received the answer, "Oh yes, that's operating a roller." So they live and learn. The length of time spent in this schooling station depends upon the new man's previous training, education and ability to learn. The time varies from one to three months.

Here, too, the recruits are taught how to keep a station neat and orderly; how to inspect, adjust, and overhaul oil circuit breakers; clean and megger switch rack insulators; keep station reports and records; operate the switchboard and do district dispatching. Within the first three days after arriving at any station the new man is required to answer in writing a set of examination questions pertaining to the fire-fighting equipment at that station. Before standing a shift as operator he must answer another set of questions embodying the operation of that particular station. This question set includes a one-line diagram of the station wiring, telephone and water systems. By this time he also should be given a start on the regular educational course put out by the department, consisting of twenty-five sets of approximately ten questions each. These he should answer at the rate of at least one set every month. Thus he is taught to use his mental as well as his physical assets.

As operators are required on other parts of the system, men are taken from these schooling stations for jobs as assistant operators at the larger stations or as operators of small stations. They still are more or less on probation; their work is watched carecully and their progress noted. In these positions they are standing on their own feet and are without the guidance of a station chief who is doing his utmost to develop them. It is during this stage that most of the men drop out or cease to advance and are dropped as a consequence. In this connection a record card is kept on each employee. On the face of this card is the usual history of the man as kept by most companies in some form or other. On the reverse side is kept a record of the examinations answered; the man's rating on his reliability, knowledge, willingness, initiative, ability to handle men, instructiveness, neatness, and perceptibility; and of any pertinent facts which have a bearing on his rating or his work. The back of the card thus shows his progress in his education and work and balances with the front of the card where his salary and position record are posted.

In conjunction with the educational course previously outlined, frequent meetings are held at various points on the system. These meetings are attended by station chiefs and operators who can arrange to leave their stations. These meetings serve not only to keep up personal acquaintances, but to present opportunity for the discussion of operating problems. Some very fine papers are written by the men about their work and read at these gatherings. A regular central meeting is held once a month from six to nine in the evening. In the general office building this is attended by department heads, division superintendents, station chiefs and electricians. There current operating problems are discussed, standardization of practices and material worked out and plans laid for the future. Minutes of all these meet-

NAME John Doe (Ohio) DATE OF BIRTH 1-3-97 MARRIED X WIDOW WIDOWER

ADDRESS 1417 Harper, L. A. PHONE NO. Az.1065 DATE EXAMINED 10-28-21 BENEFIT FUND NO. 12648

BOND NO. -- RUBBER GLOVE NO. 1788 SERVICE BUTTON NO. 1021 FIRE ARMS NO. -- SHERIFF BADGE NO. -- CO. BADGE NO. 107

YRS. GRAMMAR SCHOOL 8 YRS. H. S. 4 YRS. COLLEGE 4 OTHER COURSES ICS-EE DEPT OF SERVICE

EXPERIENCE Electrician's helper 1918-19. Electrician 1919-20. Lineman 1920-21.

15 shares common stock 2-1-22. B.P.O.E. Scotch-Irish.

Wife: Ellen Doe. 1417 Harper, L.A., Cal. Baptist.

	OCCUPATION	LOCATION	DATES	SALARY
16				
15				
14				
13				
12				
11				
10	Station Chief	Magundan	8-1-25	150.00
9	Station Chief	Magundan	5-18-25	140.00
8	1st Operator	Eagle Rock	9-10-24	150.00
7	2nd Operator	Eagle Rock	3-1-24	140.00
6	Station Chief	San Bernardino	8-1-23	140.00
5	1st Operator	San Bernardino	2-1-23	130.00
4	3rd Operator	Chino	8-1-22	120.00
3	2nd Asst. Operator	Laguna Bell	4-6-22	120.00
2	3rd Asst. Operator	Culver	1-15-22	110.00
1	Apprentice Operator	Culver Employed	11-1-21	100.00

SOUTHERN CALIFORNIA EDISON COMPANY

	2-1-22	2-1-22	8-1-23	7-1-23	1-1-24	7-1-24	3-1-25	11-1-25								
DATE OF GRADING	22	22	23	24	24	25	25									
RELIABILITY	100	40	50	60	65	70	75	77								
KNOWLEDGE	100	50	55	60	70	75	80	85								
INITIATIVE	100	40	45	50	55	60	70	75								
WILLINGNESS	100	60	62	65	70	75	80	85								
HANDLE MEN	100	40	45	50	55	60	65	70								
INSTRUCTIVENESS	100	20	30	40	50	55	60	65								
NEATNESS	100	40	45	50	55	57	60	65								
PERCEPTIBILITY	100	50	55	60	65	69	72	75								
RATING	100															

MISTAKES 1-21-22 Pulled hot disconnect. 15 kv.

CITATIONS Worked way through last two years college.

REMARKS Willing to take any job which will benefit his future success.

EDUCATIONAL COURSES	A	B	C	D	1	2	3	4	5	6	7	8	9	10	11	12	13
	97	98	100	96	94	100	92	98	95	98	100	100	98	100	95	97	
	14	15	16	17	18	19	20	21	22	23	24	25					
	96	99	100	98	100	96	98	100	97	98	100	100					

Front and reverse sides of the station operators' record card used by the substation department of the Southern California Edison Company.

ings are sent to each substation on the system so that all may receive at least some of the benefit gained by those who could attend. At a general meeting held on a Saturday afternoon, eighty-one men turned out, proving the wide general interest among the operating force.

For purposes of detail supervision there are stations known as switching centers. These are headquarters for district electricians and for the dispatching of the lower-voltage stations within the district and the lines feeding out of them. Also they are used as schools where prospective operators receive their preliminary training. Relief operators for the stations in these districts also fall under the supervision of the station chiefs of these switching centers.

The average young man of today is eager to learn and wants to get some place in the world. However, he usually has not stopped to consider the fact that for everything received a price must be paid. "Cut the jazz and get down to business," is the slogan in this case. Most of the men are laying a foundation for electrical engineering. Only by jumping into the things they do not know, do they realize how far ahead is their goal. Of the many that start not so many have the courage and driving power to stay with it and go through. Some, after coming face to face with their task, turn tail and flee; some fall into a rut out of which it is difficult to raise them, but some go through. It is upon the men who do go through that the success of the electrical operating game is dependent, and it is that kind of man we are after and hope to develop in every new employee.

With the advent of automatically controlled stations the few old "switch pullers" will find little room to stand. The operator of an automatic station must be a man who can not only operate, for there will be very little of that, but one who also can maintain his station in efficient operating condition. Switching operations now performed by ten men will be performed by one man from a central location. Thus future station attendants must know their equipment from A to Z. They will be the operators of today who are taking advantage of the instruction and opportunity presented them and who have prepared themselves for the job which is always ahead. For theirs will be no ordinary task, but that of a skilled artisan, working with the most up-to-date equipment, in a line of work in which they will be the pioneers. They will be the electrical operating engineers of the future who, because of their knowledge and experience, will design and perfect even better equipment than they are using. To take the apprentice operator, carry him through the various stages and eventually turn out a real man who is a prospective operating engineer, is the aim of the training and opportunity being offered the men in this department.

To make these men take advantage of these privileges, offered them for their own good, is the task undertaken in this plan.

The requisite effort is great and the difficulties many. Nevertheless, the results obtained through consistent pursuit of this scheme are invaluable.

Portable Mixing and Chuting Plant Proves Economical

A portable combination concrete mixing plant and chuting hoist was devised by the San Joaquin Light & Power Corporation, Fresno, Calif., and used by them to advantage in the construction of their two warehouse buildings. Inasmuch as these buildings were over 400 ft. long and less than 50 ft. wide, it was apparent at once that a portable mixing and chuting plant would effect construction economies. The situation for the use of such a piece of apparatus was ideal because a railroad spur already had been constructed between the building sites.

General view of portable mixing plant in operation.

Standard car wheels served for the truck. Upon this was built a suitable strong timber frame to carry the mixing plant and the chuting tower. The plant itself was a ¾-yd. electrically driven mixer. Cement, sand and gravel were distributed along either side of the track, the latter two being dropped directly from dump-bottom cars. Thus materials were so placed and handled that labor costs were reduced to minimum.

As the pouring of concrete progressed the plant was moved to successive new locations and the tower guyed. Construction speed maintained with this portable equipment could not have been accomplished by other means except at an appreciable increase in cost. In fact, the arrangement worked so successfully that even though the buildings consisted mainly of columns and beams with thin curtain walls concrete was poured into the forms at a total cost for both labor and material of about $14 per yard.

Remote Metering System Operates over Telephone Line

Remote metering over a distance of 60 miles has been decided upon by the Central Illinois Public Service Company. This company is faced with the necessity of recording the load of its power station near Harrisburg, Ill., at its Grand Tower station, approximately 60 miles distant. Also, it is necessary to indicate the load of both of these generating stations and a switching station located at West Frankfort which is approximately midway between the two generating stations. In addition to this, it is necessary to have an indication of the generating station loads at the load dispatcher's office at Marion, about 15 miles south of West Frankfort.

Totalizing watthour meters are employed at the generating stations. Through a system of contact these meters originate impulses which are transmitted over the company's telephone lines. By means of condensers and retarding coils these impulses are kept out of the telephone circuit, although a modification of the ringing system on the telephone lines was found to be necessary. The impulses generated by the totalizing watthour meters will be indicated and recorded on instruments known as telemeters. These meters operate in direct proportion to the speed of the impulses. This system of remote indicating and recording is known as telemetering and is a recent General Electric development. It is expected to find extensive application where it is desirable to indicate or record loads at remote points.

A Ship without a Seam.—A rivetless steel tanker with a hull as seamless as the skin of an eel has been launched at Providence, R. I. Electric welding made possible this modern marvel. Engineers investigating this new departure predict that the seamless ship will be the seagoing vessel of the future.

Energy makes the world go round; smiles remove the squeaks.

Close-up of materials handling end of portable plant used by the San Joaquin Light & Power Corporation in the construction of its warehouses. Materials were distributed directly from railroad cars.

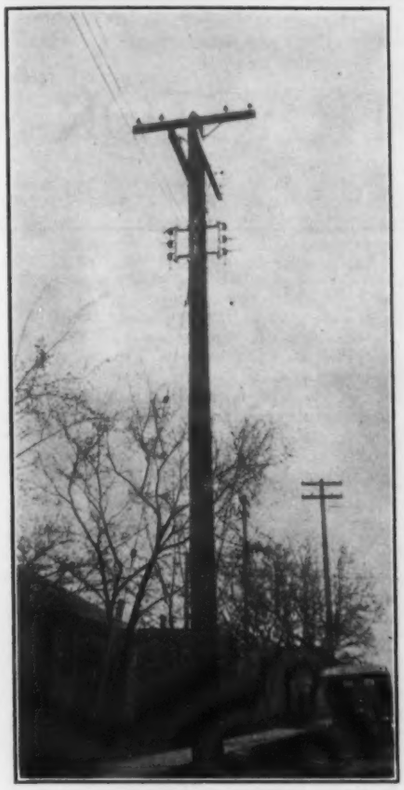


Fig. 1—Corner pole. Note services run from same pole without any complications. Three-wire secondary.

Vertical Secondary Construction Replaces Crossarms

By R. S. DANIELS, Assistant Engineer, California Oregon Power Company, Medford, Ore.

Growth in load due to the increased use of electric ranges and appliances made necessary the extensive rebuilding of the distribution system of the California Oregon Power Company in Medford, Ore. Before proceeding with the reconstruction work a survey of requirements and a study of the different methods of supporting secondary conductors were made. This was done in order that the most serviceable and economical methods might be used.

As a result of this study the general use of vertical racks for the support of secondary distribution lines was decided upon. The initial cost is somewhat less than for crossarm construction and the life of a steel rack is much greater than that of a wooden crossarm. Furthermore, steel racks are neater in appearance and tend to eliminate the usual network of crossing and recrossing wires and keep the poles clear. In running service wires the different phases do not pass over each other.

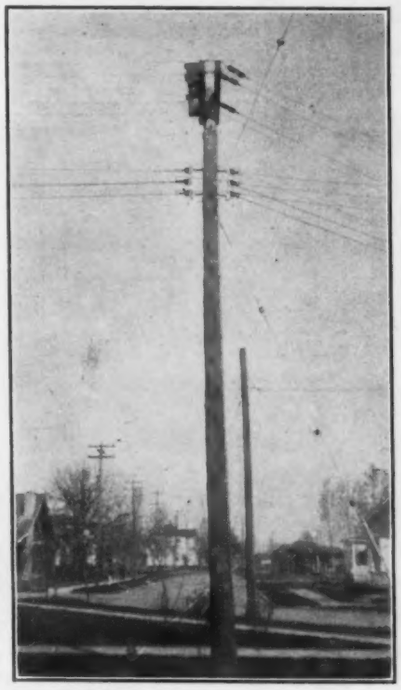


Fig. 2—Dead-end pole. Note services run without additional fixtures. Three-wire secondary.

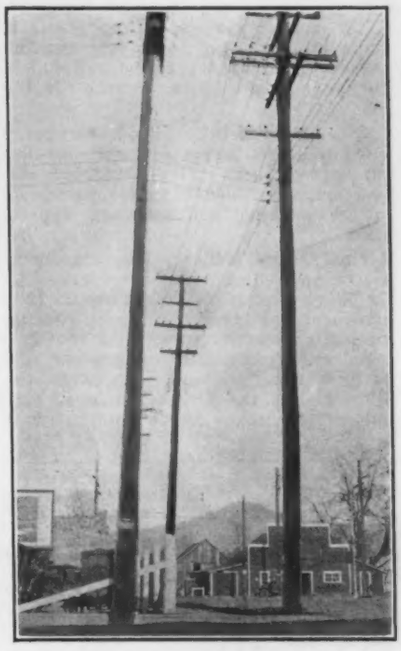


Fig. 3—Four-wire secondary distribution showing ease of taking off corner tap.

Following the decision to use this type of construction specifications were made up to insure standard applications. The heaviest type of rack is used and in nearly all cases an extension bracket is used, making the distance from the center of the pole to the conductors 15 in.

Only one set of secondary leads is run on any given pole line and they are run on the same relative side of the pole throughout the run. For all tangent runs the wires are tied on the outside of the insulator spools. The neutral (grounded) of all secondary mains is carried at the top position because in this position it acts as a guard and prevents a fallen primary wire from coming into contact with the ungrounded secondary conductors. At corner points where the length of secondary mains is no more than two spans either way from the corner it is customary to dead end the leads in both directions at the corner. All dead ends are made up with racks and the dead end itself is made on bare copper and soldered to prevent creepage of the makeup.

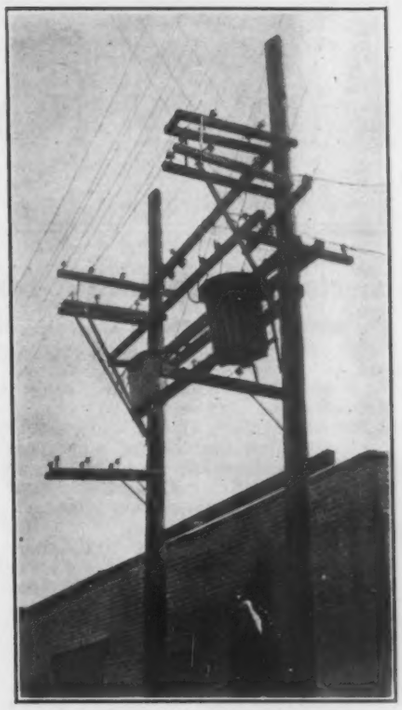


Fig. 4—Old style pole-top distribution transformer installation showing the comparatively complicated and unsightly construction. Compare with Fig. 5.

When the first racks were being installed the linemen did not like them, due mainly to the fact that their use was unfamiliar. This opposition, however, was short lived. Linemen now are boosters for this type of construction.

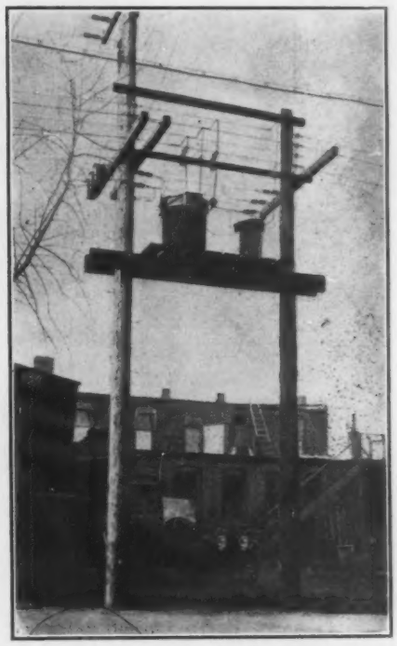


Fig. 5—New type pole-top installation of distribution transformer for light and power service. Compare with the old type station shown in Fig. 4. The transformers are connected 3-phase, open delta giving 220-volt power service and have a mid-point tap on the larger unit which gives two 110-volt lighting circuits. The angle from which the picture was taken makes it appear as if there were some confusion of secondary connections above the larger transformer which, of course, is not the case.

IDEAS FOR THE CONTRACTOR

Electrical Estimating for the Contractor — VI (a)

Modern Electrical Installation in Well Designed Plant of Furniture Manufacturing Company

By J. R. WILSON*, Engineering Department, Los Angeles Electric Works

The new factory of the White-Smith Furniture Manufacturing Company is an example of modern plant layout, on the basis of utilizing all available floor space with maximum economy in operating cost.

In designing this plant the owners spent a great deal of time in analyzing the future possibilities of trade expansion for their product. With this idea in mind they made their plant layout as flexible as possible to meet changes which might arise. This concern manufactures a high grade of bedroom furniture and sells its product at all points on the Pacific Coast, as well as in Hawaii, Texas and some of the eastern markets.

The general scheme of the plant layout is based upon the raw product of walnut, mahogany and other lumber entering the plant from the rear of the building where the stock piles are located. After the lumber is passed through the various machines for fabrication, it continues on to the assembling and cabinet-making departments where the different parts are assembled into the completed piece of furniture. After passing inspection for defects in material or workmanship, the product passes on to the spraying and finishing rooms and then to the drying rooms.

After the finish has dried thoroughly the product is inspected again for finish defects, and if it passes this inspection, the finished article passes on to the packing and shipping department.

This scheme adheres very closely to the recognized standard as practiced by the large eastern manufacturers. It is known as the straight-through routing method of manufacture. The raw material enters the plant at one end and never turns back until it leaves the other end in the form of finished product. This makes for economy of floor space and operating cost and also increases plant production.

It is interesting to note that the percentage of rejects on the final inspection is very small. This is due to the fact that the plant owners are men of wide experience in their line and each employee has become imbued with the plant slogan: "We must strive to make good furniture so well and so cheaply that we will have steady employment."

The plant owners designed their building with this operating scheme in mind, with the result that the structure is of the one-story design, of the long and narrow type of building. The walls are of brick with heavy wooden beams and posts supporting the roof. The building is so designed that an additional story may be placed without any changes being made in the present structure and without stopping present plant operation.

Before starting construction a floor plan of the building was tacked to a board, and pieces of cardboard of proper shape and scale size to represent each machine were provided. The owners spent many months of study in the placing of these cardboard "dummies" before the plant layout finally was decided upon. After the location

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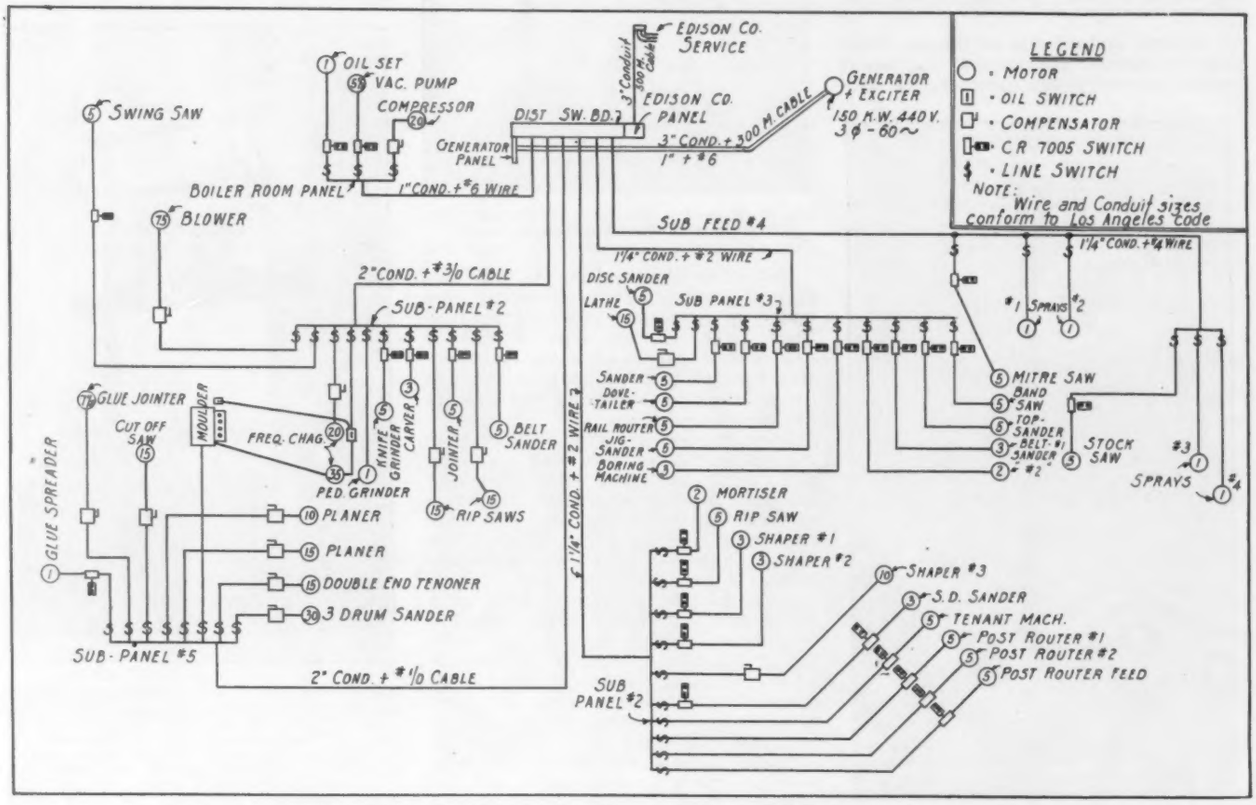


Fig. 1.—Schematic diagram of wiring layout in the plant of the White-Smith Manufacturing Company.

of each machine had been decided, the floor plan was revised to include the machinery set-up and the plans were submitted to the electrical contractors for estimates.

This plant is located in "the central manufacturing district" of Los Angeles and the policy of the district is to provide the building for each manufacturer and install the lighting equipment. The owners retained Holes & Sanborn, electrical and mechanical engineers of Los Angeles, to supervise the power installation in this plant.

No electrical plans or specifications were provided; each contractor was required to submit his own layout and specify the type of equipment he proposed to furnish.

The successful bidder was awarded the contract on a "time and material basis," with the guaranteed maximum cost limit.

There were two very interesting items in connection with this job that do not appear in most jobs of this nature. The first was the use of a "partial load" isolated plant working in conjunction with the regular source of current supply from the Southern California Edison Company.

One of the problems with which this firm was confronted was to obtain an adequate and continuous supply of properly kiln-dried lumber of the quality which enters into its product. To overcome this handicap and to insure a practically unlimited supply of raw material a complete steam dry kiln was included in the plant layout. To provide for possible future needs the boiler capacity was made considerably larger than the present plant requirements would warrant.

After the local power shortage of last winter with its attendant inconveniences, the owners of the plant decided to make use of this surplus steam capacity by installing an auxiliary steam-driven generating set, this as a means of reducing their power bills and safeguarding themselves against any possible future power shortage or outage.

An addition was built to the original boiler room and a used engine and generator were purchased and installed in this building. This set consisted of a G. E. 150-kw., 440-volt, 60-cycle, 600-r.p.m. generator with built-in exciter, belt-driven by a Murray Iron Works 14 x 36 horizontal standard Corliss engine, with a 12-ft. flywheel. The Edison company service also was removed from the original location and re-installed in this new building.

The electrical contractor designed and installed a switchboard layout to include the Edison company panel, the generator and exciter equipment, and a distributing switchboard. This distributing switchboard was so designed that it is now possible to operate any part of the plant on either Edison or generator as may be desired, or as the surplus steam capacity may permit.

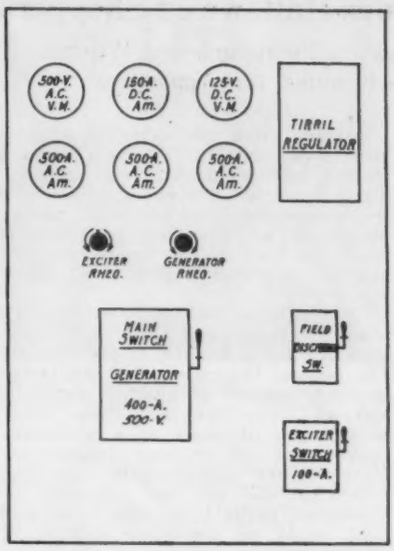


Fig. 4.—Diagram of the generator panel in the boiler room of the White-Smith Manufacturing Company.

To make this scheme of operation possible a separate conduit line and feeder was installed to each sub-power panel in the plant. At the main switchboard each of these feeders is connected to a double-throw switch. An ammeter is connected to one phase of each of the feeders so that it is possible for the engineer to tell at a glance just what the demand is on each feeder. By watching the steam gages and these ammeters a very flexible scheme of load handling has been developed. The double-throw switches were designed for very quick operation. Any feeder can be shifted instantly from Edison to generator or vice versa without "dropping the load."

Figs. 2 and 4 show clearly the arrangement of the main switchboard and generator panel. The Tirrill regulator was installed because of a load fluctuation and also because the generator set is 60 cycle. The Edison service is 50 cycle and all of the plant speeds are based upon 50-cycle operation. It is necessary to run the generator at a speed which will conform as nearly as possible with these predetermined machine speeds.

(To be continued)

1925 National Electrical Code Now Being Distributed

Copies of the 1925 edition of the National Electrical Code published by the National Board of Fire Underwriters are now available and are being distributed by the Board of Fire Underwriters of the Pacific, 914 Merchants Exchange Building, San Francisco; applications for copies should be sent to that office. It is not necessary to send in an application for copies if this has been done previously, as all back orders are being filled.

The biennial revision of the Code was performed by the National Fire Protection Association as the sponsor organization through a sectional committee of the American Engineering Standards Committe which has approved it as an American standard.

Brute!

Wife: "Judging by this article on electricity, very soon we'll get all we want by touching a button."

Hubby: ""You'll never get anything that way because you never touch a button. Just look at my shirt."—Exchange.

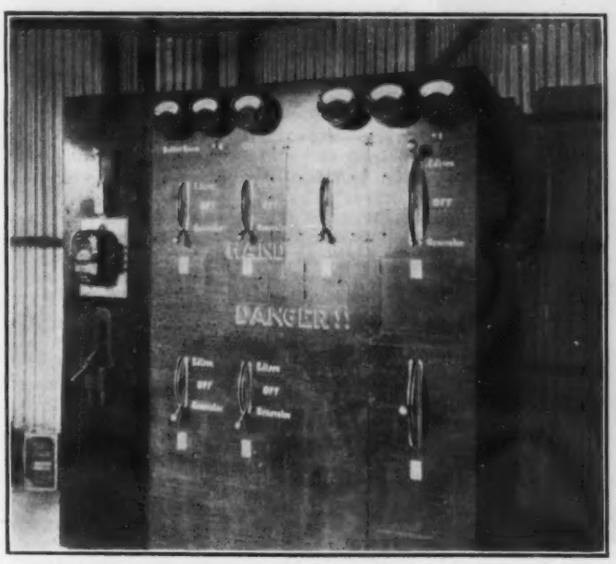


Fig. 2.—Distributing switchboard showing the Edison company panel on the left. The generator panel may be seen on the right end.

Fig. 3.—Sub-panel 1. Sub-feeder 1 from the main switchboard may be seen on the right.

BETTER MERCHANDISING

Spooky Window Display Stops Hallowe'en Shoppers

Atmosphere Created by Corn Shucks, Pumpkins, and Witches Makes Effective Display Background for Appliances

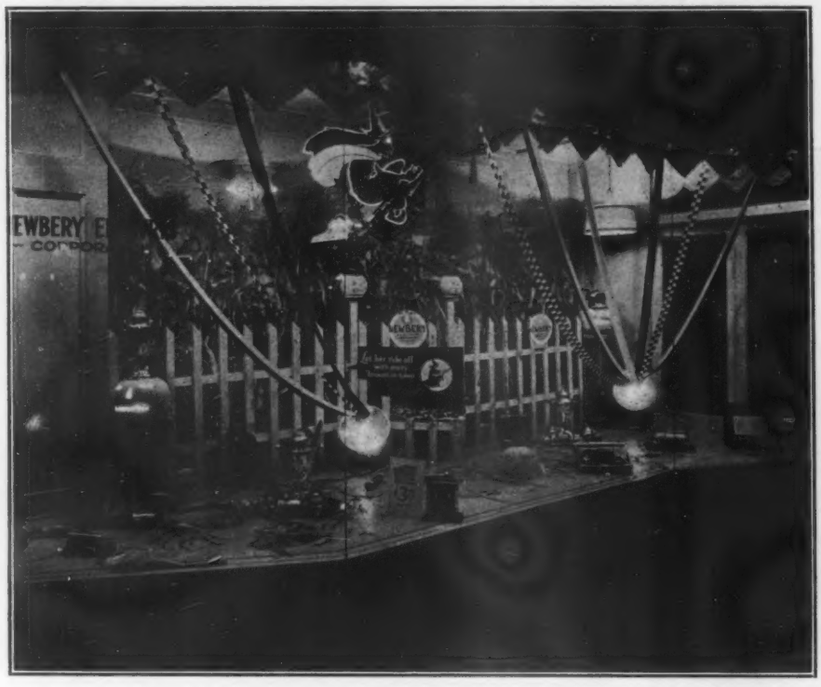
An armful of corn shucks, a couple of pumpkins, a paper witch, and some electrical merchandise well displayed, these in original arrangement, contrived to stop Hallowe'en crowds who passed the windows of the Newbery Electric Corporation of Los Angeles during the latter days of the harvest time.

At a cost of $5.50, of which the chief items were two pumpkins and an armful of corn purchased from a local farmer for $2.50, the entire display was arranged. That it was a most attractive one was vouched for by the comments heard after its display.

For a background the green cornstalks were used, being held in place by a piece of fine magnet wire, and a picket fence was built in front of the corn. The fence was left unpainted and had a gate swinging open from it at the center of the window. The open gate provided an appropriate place for an advertising poster showing a witch riding off on a broom, with the caption, "Let her ride off with every broom in town," the inference being that vacuum cleaners might well take up the sweeping of the city.

A large witch was made out of cardboard and made to ride on a vacuum cleaner, both suspended from the ceiling. In the witch's eye a small electric automobile lamp was fixed, and by means of a "Skeedoodle" plug was made to blink. The lamp was red and was operated from a small transformer.

From the reflector-type electric heaters, streamers of black and orange were run up to the top of the window. The heaters themselves had red lamps in them instead of heating elements, and all were lighted. Three black paper cats, obtained at a stationery store, were set to lean against the fence. A few papier-mache false-face pumpkins, and the real pumpkins illuminated, paper bats, corn husks and cobs, made up the other articles of decoration.



Attractive Hallowe'en window arranged at small expense by the Newbery Electric Corporation of Los Angeles. This window stopped passersby to rivet their attention upon electrical merchandise.

Muslin Covers for Appliances Protect from Scuffing

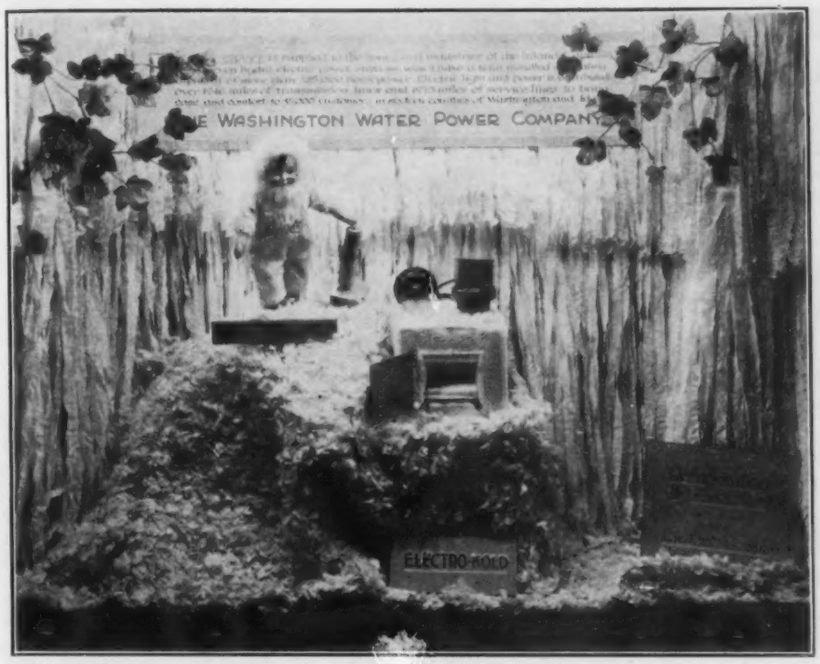
A careless broom, a too ambitious rearrangement of appliances on the floor, a thousand things which may happen in the best intentioned day about a stock room, take toll of the paint which should be so shiny and new on appliances before they are sold. To many dealers the only safeguard is to leave the appliance crated until it is delivered, taking all chances with the demonstrator only.

Not a shroud, merely an ingenious idea used by the Pacific Power & Light Company of Portland, Ore., to keep washing machines and other appliances from being scuffed while in stock and uncrated.

To make more flexible its stock handling and to protect its appliances from the scuffing and bumps that sometimes occur in spite of precautions, the Pacific Power & Light Company of Portland, Ore., has evolved a handy "smock" with which to cover its larger appliances while in stock.

This covering consists of unbleached muslin cut and sewed to conform with the shape of the appliance to be protected. Taking that used for the covering of washing machines as an example, about two yards of muslin serves the purpose. Similar covers are used to protect electric ranges, ironers and other large appliances.

By using covers of this kind it is possible to uncrate the appliances in the storeroom and in case an appliance has to be shown to a customer in there, all that is necessary for showing is a quick removal of the cover and the appliance is in presentable condition for exhibition. This protection not only improves the appearance of the storeroom and of the appliance for display, but prevents shop wear and saves many a knock that would take off paint, according to the experience of that company.



This chilly scene warmed up many prospects for electric refrigeration when it was put on display in the windows of The Washington Water Power Company, at Spokane.

Realism and Fancy Combine in Refrigerator Display

That well known and much advertised thing, "the power of suggestion," was applied with success to a recent window display of electric refrigerators arranged by The Washington Water Power Company, in Spokane, Wash. The thing suggested, the entire theme of the display, as it were, was icy and frigid, entirely a proper atmosphere for electric refrigeration.

A small Eskimo Kewpie doll provided the human element in the scene which the window was arranged to depict. It stood high upon a bank of realistically arranged paper snow and was set off by streamers of paper icicles. In the center of the stage was placed a frost tank of an Electro-Kold refrigerator, the compressor being concealed behind the window. The tank became heavily frosted and conveyed an idea to those who passed the window of the refrigeration possible by the use of electricity.

Official Returns from Electric Refrigeration Survey Trip

Covering a period of three months and an itinerary of more than 12,000 miles through the United States and Canada, S. M. Kennedy, vice-president in charge of business development and public relations, Southern California Edison Company, Los Angeles, has completed a survey to date of the development of mechanical refrigeration for domestic purposes.

Mr. Kennedy believes that the central station company contemplating entrance into this field should make itself familiar with the following five basic factors: type of machine, cost of servicing, merchandising methods, conditions of sale, and financing of time contracts.

"Since every central station company is anxious to get on its lines additional load without additional expenditure, this type of business is going to be most cordially welcomed by the industry," states Mr. Kennedy in his report. "Many applications for service are received which the company is compelled to refuse because the expense of carrying the service lines to the applicant is out of proportion to the anticipated revenue. The installation of an electric refrigerator in the home or homes of such applicants will in many cases enable the power company to build the extension and give the desired service with mutual benefits."

Mr. Kennedy is particularly enthusiastic over the usefulness of electrical refrigeration in the rural districts where the householder who now wishes ice must drive to the nearest town for it and act as his own deliveryman.

"When it is considered," the report concludes, "that the electric way is more reliable, more convenient and more sanitary than the old-fashioned method of obtaining refrigeration, and at the same time is as low or even lower in operating costs, it is not difficult to visualize the wonderful possibilities which lie ahead in the field."

San Diego Department Store Has Large Electric Section

Holzwasser, Inc., one of the largest department stores of San Diego, Calif., has opened a fully equipped electric appliance department, C. H. Robbins, formerly of the Hurley Machine Company of Los Angeles, in charge.

This department is located on the first floor, with direct street entrance and a large show window attractively decorated. The store makes a feature of servicing all electrical goods sold by it and has a corps of sixteen men in the sales and service section of the electrical department.

Charles Holzwasser, president of the concern, is authority for the statement that the electrical business of the store is excellent and that the volume of sales, particularly in vacuum cleaners and washers, has exceeded all expectations. It is his present plan to increase the floor space more than double that now allotted to the electric appliance department.

Merchandising of electrical appliances by the Holzwasser department store closely followed its establishment of a radio sales department.

Prize-winning window of the Electric Furnishing Company, 822 Sprague Avenue, Spokane, of which F. A. Jahnke is proprietor. This display took first prize in the electric store class in the contest for the best merchandising window in the United Fall Exposition, Spokane, Sept. 3-4, 1925

NEWS OF THE INDUSTRY

Selling and Public Relations Stressed at Wyoming Utility Association Meet

For the first time in the history of the organization, commercial department methods and the necessity for efficient selling whether of energy, service, public relations or merchandise, were discussed and emphasized at the recent convention of the Wyoming Utility Association held at Cheyenne, Nov. 16-17.

Along with the commercial discussion two other ideas were stressed: first, the change in attitude on the part of utility companies during the past ten years, and, second, the demand that every employee of a utility realize his responsibility to the company and to the public in the nation-wide movement to improve public relations.

One speaker urged dismissing the employee who fails to sense his responsibility rather than transferring or demoting him. The need of utility executives to serve as examples and inspiration for employees was demonstrated as a prerequisite to such action, however.

While attendance at the convention was not as representative as at the Casper meeting a year ago, those present expressed their appreciation of the constructive program which was provided and outlined plans immediately which would interest absent members in the divisional N.E.L.A. midwinter meeting in Denver in December and the next meeting of the Wyoming association. A large Colorado delegation was present and pledged its interest and support.

The convention was opened auspiciously by Governor Nellie Tayloe Ross in an address of welcome that included a keen insight into public utility problems and a statement of confidence on the part of the state administration in its relations with the various utilities through the commission. In his welcoming address H. B. Henderson, Jr., president Cheyenne Chamber of Commerce, stressed the value of customer-ownership of utility securities as observed from his own experience.

The Wyoming association boasts of the membership of a motor bus company which operates in Casper and the adjoining oil fields. W. B. Cobb, manager of the Casper Motor Bus Line Company, read a paper on "The Progress of the Motor Bus as a Public Utility," and injected a new note in the electrical, gas, and telephone gathering by showing some of the obstacles encountered by a motor bus company which, while classified as a common carrier, was not fully legalized or respected as a public utility. Present conditions in Wyoming seemed to indicate under-regulation in this respect rather than over-regulation, in Mr. Cobb's opinion.

The three fundamental reasons for merchandising on the part of a utility, and especially of central stations, was explained by G. B. Buck, superintendent of electric sales, Public Service Company of Colorado, with headquarters at Denver. He said that public relations, gross merchandise sales and revenue increases demand efficient merchandising. Charts illustrating and demonstrating the various points of the talk were shown and included one showing that central-station selling methods at the present time are only forty per cent efficient. The interest manifested in this subject led to further discussion following the luncheon and business meeting which concluded the convention.

Related to the commercial discussion was the part which advertising is playing in the utility business. "Making Advertising Do its Job" was the subject of the paper presented by Joseph E. Moorhead, assistant publicity director, Mountain States Telephone & Telegraph Company. On this subject the work of the Rocky Mountain Committee on Public Utility Information and the impetus which it has given to all forms of utility publicity in the Mountain region was commended highly.

One of the features of the social program was the entertainment arranged at Fort D. A. Russell, adjoining Cheyenne, the first night of the convention. It consisted of a program of boxing bouts. A number of women attended.

C. L. Titus, state manager for the telephone company and president of the association, presided at the meetings and arranged the convention entertainment program. In the annual election James Potts, manager of the Rawlins Electric Light & Fuel Company, Rawlins, Wyo., was named to succeed him. James J. Withrow, manager of the Sheridan County Electric Company, Sheridan, Wyo., and W. D. Johnston, general manager of the Mountain States Power Company, Casper, Wyo., were elected vice-presidents. H. C. Chappell, Midwest Public Service Company, Casper, was elected treasurer. The secretary of the association will be appointed later by the president. The officers along with R. E. Richardson of Lovell, retiring treasurer, constitute the new executive committee.

Mrs. C. L. Titus served as hostess to the ladies attending the convention.

Japanese Utility Plans New Development Project.—The Ujigawa Electric Company of Japan is contemplating a new hydroelectric development project, according to Denkinotomo. Plans include the construction of Ohmine power house with a capacity of 16,000 kw., a plant on the Takatoki River to generate 1,064 kw., and the Kiwada plant of 735-kw. capacity. The total construction cost is estimated at 7,000,000 yen.

Julia Groo's Prize Electric Home Is Exhibited in Portland

Through the courtesy of Julia Groo, eighteen-year-old high school student of Portland, winner of the National Home Lighting Contest conducted throughout the United States last year, the $15,000 prize home won in that contest was thrown open to the public as an electric home exhibit on Nov. 1, 1925. On Sunday, the opening day, 1,900 visitors were received and conducted through the house, and many more, discouraged at the apparent size of the crowd, went away without going through, expressing their intentions of returning at another time. It is planned to keep the house on exhibition afternoons and evenings for two or three weeks or until practically everyone desiring to inspect it has had the opportunity to do so.

This is the first electric home publicly displayed in Portland and machinery for this exhibit was set in motion early this year, soon after the announcement of the winner of the contest, when Miss Groo expressed her intention of having the home built in Portland. Arrangements for the electrical features of the home were made by the same committee that conducted the Portland Home Lighting Contest (Journal of Electricity, Oct. 15, 1924, p. 306) and is composed of representatives of all branches of the electrical industry, headed by F. H. Murphy, illuminating engineer, Portland Electric Power Company. No effort or expense has been spared to equip the home completely with electrical conveniences, among which is complete equipment for heating electrically. A description of the electrical features of the home, illustrated by photographs, will appear in a later issue.

Prize home of Julia Groo, Portland high school girl, given to her as the first prize in the National Home Lighting Educational Essay Contest of last year. The home recently was opened by Miss Groo for public inspection, making Portland's first electric home exhibit.

Mountain States Power Company Inaugurates House Organ

A publication devoted to the interests and activities of employees of the Mountain States Power Company, Tacoma, Wash., has been started by that company, which is a Byllesby holding, and the first issue was distributed Nov. 1. The new paper has not been named, the first number carrying a request that employees submit suggestions for a permanent title.

This house organ will not be issued on regular schedule, but will be published whenever suffcient news matter is found available.

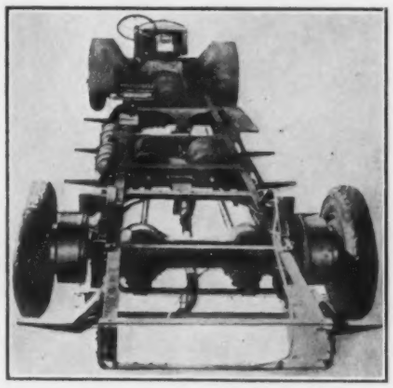
Other Western companies, operated under the direction of the Byllesby Engineering & Management Corporation, that issue publications for their employees are the San Diego Consolidated Gas & Electric Company and the Western States Gas & Electric Company, Stockton, Calif.

Gasoline-Electric Motor Bus Put On Run by L.A. Railway

A double-deck bus, driven by electricity, with generation of that electricity by means of a gasoline engine, is to be tried out by the Los Angeles Railway, according to announcement made by that company recently. Smoothness of operation, especially as to acceleration and control in traffic, is claimed for this new type of bus.

The bus is of the Fageol type with General Electric drive. To all appearances a gasoline car, the gas engine is used to turn over a generator and exciter direct-connected to the crankshaft and placed where in ordinary cars the transmission usually is located. Instead of gear shift, the bus is accelerated by means of a stepped switch, whereby more current is fed to the two electric motors which drive the car. These motors are located near the center of the chassis.

Advantages claimed for this type of drive are higher rates of acceleration and schedule speeds, and greater comfort for passengers, since the electric drive is silent in operation and the jerking of gear shifting is eliminated. Skidding is prevented by the two-motor drive, which eliminates the mechanical differential. Maintenance costs are low, it is claimed, as the engine makes 20 per cent fewer revolutions when running under city conditions.



Chassis of gasoline-electric motor coach, in which the gasoline engine turns a generator, the current from which drives the bus by means of two electric motors shown at the center of the chassis.

Plans Completed for Execution of Red Seal Plan in California

Progress is being made in the execution of the Red Seal Plan in California. The first step essential to this was the division of the state into districts, in each of which a committee has been appointed to be held responsible for the conduct of the program within that district.

In determining upon the boundaries of these districts two factors were given consideration: first, the division into power company territories; and, second, the boundaries of electric leagues and clubs which now are functioning over a large percentage of the state. Such consideration made possible the division of the state into twenty-five clearly defined districts. A letter then was addressed to the sales manager of each power company asking him for a list of those representatives of his company whom he would be willing to authorize and instruct to accept a committee responsibility in this program.

With the replies from the sales managers at hand, twenty-five committees, one for each district, have been selected, constituted of one or more power company men and the contractor-dealer president of the electric club or league functioning in that district. These committees have been named tentatively and now are to be re-submitted to the power companies for their final approval.

With practically half of the population of California occupying the metropolitan areas of San Francisco and Los Angeles, it is apparent that the proper execution of the program in these two centers offers the greatest problem. A committee therefore has been appointed in San Francisco under the chairmanship of H. M. Crawford, sales manager of the Pacific Gas and Electric Company, and a similar committee appointed in Los Angeles under the chairmanship of W. L. Frost, general commercial manager of the Southern California Edison Company. These committees are charged with the responsibility of outlining a definite course of procedure which will permit the inspection and affixing of seals necessary under this plan to be done in the most efficient manner and with a minimum expenditure of time. The committees now are functioning, Mr. Crawford already having submitted a preliminary report of the activities of the San Francisco committee.

The legal agreement between the Society for Electrical Development and the California Electrical Bureau in the form of a license authorizing the bureau to act as the society's agent in promoting the Red Seal plan in California now has been received, together with a suggested form for use in licensing each of the twenty-five districts. With these licenses at hand and the necessary material in the form of job cards, meter stickers and owners' certificates about ready and the organization awaiting merely the confirmation of the appointments which have been made, everything is about prepared to take full advantage of the interest which has been evidenced in the Red Seal program.

The issuance of the required minimum standards a few months ago, several stories which have appeared in the Journal of Electricity, and the announcement of the purpose of the plan at the San Diego convention of Electragists, Southern Division, and the Eureka convention of Electragists, Northern Division, all have awakened an interest which has contrived, despite every effort to hold it in abeyance, to result already in demands for inspection and material for a number of Red Seal homes.

The plans also call for the appointment in the near future of an advertising committee whose responsibility it shall be to determine to what extent display advertising shall be utilized in promoting the Red Seal plan, to prepare series of contractor advertisements to be made availabe to contractors in either mat or plate form for use in their local newspapers, and to prepare and place publicity stories wherever possible, including those media used for display advertising, the Journal of Electricity, and the house organs of the power companies. The Southern California Edison Company already has on hand a fully prepared series of Red Seal advertisements for use in newspapers throughout its territory as soon as the program is launched.

A finance committee composed of W. L. Frost, chairman, D. E. Harris, E. O. Shreve, H. L. Harper, and K. E. Van Kuran, was appointed at the last meeting of the advistory committee for the purpose of preparing a budget covering the cost of the bureau's planned operations for 1926 and to raise the funds necessary to meet this budget. This committee now has a budget in the course of preparation.

By means of regular monthly reports of the progress of the Red Seal plan the bureau will be in a position to present for the frequent and periodic consideration of its contributors concrete evidence of the returns of their investment in the bureau.

"White-Way" Lighting in Provo, Utah, Business District

The new "white way" of the business district of Provo, Utah, formally was placed in operation early in October, and the district now claims to rank among the best lighted in the country. Among the prominent guests present at the inauguration of the new lighting system were George H. Dern, governor of Utah, a number of city officials of other Utah cities, and several members of the General Electric Company's Salt Lake City branch office.

The new lighting system, officially known as lighting district No. 1, extendsc from First East to Fifth West Streets on Center Street. There are ten standards to the block, five on each side of the street, upon each of which is mounted two 1,000 c.p. incandescent Novalux units. This gives a total of 20,000 c.p. a block, or 50 c.p. a linear foot of street, and this intensity compares favorably with that of American cities of a population of 30,000 or more. There is a total of 124 lamps, of which 36 will burn all night and 88 will be turned off at midnight each night.

Ice Men Consider Sale of Electric Refrigerator to Offset Losses in Ice Business

That the ice men are concerned deeply with the growth of electric refrigeration in the homes of the country was reported to the merchandising committee of the Commercial Section, Pacific Coast Electrical Association, at its recent meeting in San Francisco, by C. C. Crawford, industrial power engineer for the Portland Electric Power Company. Mr. Crawford had attended the ninth annual convention of the National Association of Ice Industries held in Los Angeles, Nov. 10-14.

Mr. Crawford reported the general attitude of the ice men as that of being fully awake to the prospect of losing a great volume of ice business in the United States due to the electric refrigerator. A special report on household refrigeration was presented by A. Hardgrave, chairman of a committee studying the subject from its effect on the ice industry.

The committee reported that there were 200,000 electric refrigerators in use in homes in 1925, and that the ice manufacturers lost an annual gross revenue of $10,00,000 from their use. It also estimated that by 1930 the annual loss in revenue would reach $70,000,000.

Opinion was divided as to what steps ice men should take to offset these losses, although it was generally felt, Mr. Crawford said, that the electric refrigerator had come to stay and that it was a matter of adjusting the ice business to that uncomfortable fact.

The committee recommended a nation-wide advertising campaign by the establishment of local home economic departments similar to those found successful by light and gas companies, and extensive local and national advertising to develop a more extensive use of household refrigeration, by whatever means, ice or electricity. In the latter connection it was pointed out that steps are being taken to seek the co-operation of the National Electric Light Association on a co-operative advertising campaign for refrigeration in which the increase of business would reflect to the benefit of both electric utilities and ice companies.

Some ice manufacturers felt, according to Mr. Crawford, that the best means of combating the losses would be for ice companies to enter the field of domestic electric refrigeration sales. A company of Portland, Ore., already is embarking upon such a plan, Mr. Crawford reported. It is felt that the profit from the sales of electric machines will offset the lost revenue from ice sales for many years.

A fear was expressed in the merchandising committee meeting of the Pacific Coast Electrical Association that the servicing of electric refrigerators would be passed on to the power companies, but reports from representatives of refrigerator manufacturers showing the extensive steps being taken by such manufacturers to provide satisfactory servicing for their products would tend to show that the situation will be cared for.

Mr. Crawford also reported that ice cream manufacturers and soft drink supply companies were making plans to install electric refrigerators for their customers, a move which would cut down further the ice consumption in many quarters.

Electric Locomotive Outpulls Two Steam Competitors

Demonstrating again the superior qualities of the electric locomotive over those of steam locomotives the Chicago, Milwaukee & St. Paul electric locomotive No. 10253 outpulled two freight locomotives of the same line at a test staged in the Cascade Mountains in October. While these contests have been staged before, they always are interesting and generally the conditions under which the tests are carried on are different. Such is the case in this instance.

One of the two freight locomotives was a 150-ton type C steamer having eight driving wheels. The other was a 278-ton Mallet compound with twelve driving wheels. A combined normal tractive effort of 57.6 tons was available from the total weight of 428 tons for the two steam locomotives. In addition to this normal tractive effort was added nearly 14 tons due to the approximate 2 per cent grade which they had in their favor. This made a total pulling force of over 71 tons, normal rating, for the two steamers.

The electric locomotive was a standard bi-polar 3,000-volt gearless passenger locomotive having a total weight of 265 tons and a normal tractive effort of 68.5 tons. Twelve driving motors, the armatures of which are mounted on as many axles, furnish the motive power. The driving wheels are 44 in. in diameter, and the total overall length of the locomotive is 76 ft. Five of these electrics are in operation on the Coast division of the railroad between Tacoma and Othello in the state of Washington.

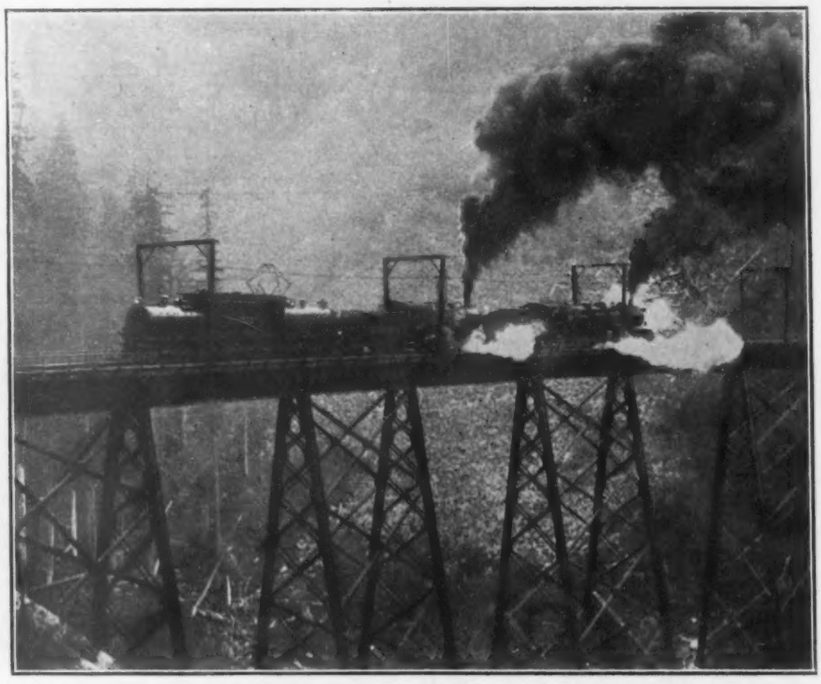
This particular demonstration was staged not as a test by the railroad, but at the request of the Universal News Reel Service.

California Byllesby Companies to Merchandise Appliances

With the leasing of the building adjacent to its present offices in Stockton to provide space for a high-class appliance sales room, the Western States Gas & Electric Company is preparing to be the first of the Byllesby companies in California to enter the appliance merchandising field. The entrance of this utility into merchandising will be followed at an early date by the remaining Byllesby companies in the state, which include the San Diego Consolidated Gas & Electric Company, the Coast Valleys Gas & Electric Company and The California Oregon Power Company.

The Western States Gas & Electric Company will carry a complete line of gas and electric appliances, and its merchandising plans include an extensive load-building campaign. The Stockton store will consist of a 100-ft. corner location in the heart of the business district that will be one of the most modern in the West. Following the establishment of a store in that city, stores will be established in Richmond and Eureka, Calif., if conditions warrant. Appliance merchandising will be under the direction of the company's commercial department, of which H. K. Griffin is the head.

It is expected that all Byllesby companies will be merchandising actively by shortly after Jan. 1, 1926.



Spectacular tug-of-war staged in October near the western portal of its Cascade tunnel by the Chicago, Milwaukee & St. Paul Railroad

N.E.L.A. Women's Committee Visits Salt Lake

A delegation of members of the Women's Committee of the Public Relations Section of the National Electric Light Association were guests of the Utah Power & Light Company at Salt Lake City on Oct. 22. The following women, each of whom is chairman of a district in the Northwest, were in

Members of the N.E.L.A. Women's Committee of the Public Relations Section, Northwest Division, who visited Salt Lake City recently. Top row—Miss Esther Miller, Miss Edna Comstock, Miss Stella Dorgan, Miss Marguerite Butler, Miss Charlotte Cummings, Mrs. Nina Johns, Mrs. A. W. Angell, Miss Ellen McCurdy. Lower row—Mrs. Evva O. Moyle, Miss Nelle Duffey, Mrs. L. A. McArthur, Miss Mary K. Walsh, Miss Dottie Southwick.

the party: Miss Ellen McCurdy, Pacific Power & Light Company, Walla Walla, Wash.; Mrs. A. W. Angell, Northwestern Electric Company, Portland; Miss Esther Miller, Grays Harbor Railway & Light Company, Aberdeen, Wash.; Miss Dottie Southwick, Pacific Power & Light Company, Portland; Mrs. Nina Johns, Idaho Power Company, Boise; Miss Mary K. Walsh, The Washington Water Power Company, Spokane; Miss Edna Comstock, Oregon Public Utility Information Bureau, Portland; Miss Nelle Duffey, Puget Sound Power & Light Company, Seattle; Miss Stella Dorgan, Mountain States Power Company, Albany, Ore.; Miss Marguerite Butler, Portland Electric Power Company, Portland; Mrs. L. A. McArthur, Pacific Power & Light Company, Portland.

Mrs. Evva O. Moyle and Miss Charlotte Cummings, of the general offices of the Utah Power & Light Company, had charge of the entertainment of the visitors. Mrs. Moyle is chairman of the Utah district.

During the morning an interesting meeting was held, during which there was a round-table discussion of matters pertaining to the education of women employees of public utilities concerning their companies' affairs in order that such women employees may be in a position to do their part in cultivating the good will of the public. The meeting also was addressed by D. C. Green, vice-president and general manager of the Utah Power & Light Company.

Monrovia to Have Light District.—A petition to install ornamental street lights on Wild Rose, Oakdale, Lime, and Lemon Avenues, from Shamrock Avenue to an alley 600 ft. north, has been approved by the board of trustees of Monrovia, Calif. Concrete posts with single globes are specified.

Recommends $2,500,000 Utility-Bond Issue to Develop Second Skagit Unit

As the next step for further Skagit development, for which he asks a $2,500,000 utility-bond issue as soon as possible, J. D. Ross, superintendent, of the city light department, filed with Mayor Brown of Seattle recently a report embracing the following recommendations for the extension of Seattle's municipal electric plants and system:

Construction of an extension of the railroad from the present terminus of the Skagit railroad at Gorge Creek to Diablo Canyon, a distance of four and a half miles, at an estimated cost of $425,000.

Installation of a third unit of 25,000 hp. at the Gorge power house, increasing the output to 75,000 hp., at a cost of $600,000. This would include additional transformer capacity at the Seattle end of the transmission line, according to the estimate.

Simultaneous construction of a dam at Diablo Canyon, at an estimated cost of $1,250,000.

Continuing with his program for future development, Mr. Ross goes on to recommend a dewatering tunnel to the Diablo plant from Reflector Bar as the next step, with a power house capable of delivering 110,000 hp. at Diablo. Ruby dam would be started at the same time as the Diablo power house, and this step, complete, is expected to cost $5,150,000. This plan would save the cost of building a railroad to Ruby, a difficult road to build, making it possible to transport materials for Ruby dam by water over the lake formed by Diablo dam. It also is claimed for this program that timber can be removed from the Ruby dam basin and marketed much more satisfactorily than by rushing the dam through as the first part of the expansion program.

Right-of-way for a transmission line from Bothell to South Station in Seattle also is included in the initial bond issue of $2,500,000, and is estimated to cost $211,000. The line would be built later. Wood tower line to the city is specified for this line, with steel-tower line within the city.

A similar report on Skagit development, laying down a program for twenty-five years of cumulative building activity to meet the demands estimated to result from Seattle's growth during that period, was filed with Mayor Brown by the Skagit engineering commission about the same time. On this commission were Maj. Joseph Jacobs, W. Chester Morse, and Stirling B. Hill, Seattle hydraulic engineers.

This report recommends: a Seattle-Tacoma tie line; the construction of a third Gorge unit; construction of Bothell switching station and steel tower line through the city; extension of the railroad from Gorge to Diablo; construction of Diablo power house, with first unit of 23,000-kw. capacity; construction of a second wood-structure line from Diablo to Bothell substation; construction of a second Diablo unit of 23,000 kw., and the following year, 1934, enlargement of Diablo power house and installation of a fourth unit of 23,000 kw.; construction of a concrete masonry dam at Ripraps or Ruby; a still further extension of the Diablo power house and installation of a fifth unit of 23,000 kw.; further extension of Bothell substation; construction of a third transmission line from Diablo to Bothell; the enlargement of Gorge power house and installation of a fourth unit of 20,000 kw.; construction of the Ruby or Ripraps power house with first unit of 20,000 kw., designed to develop 28,000 kw. when higher head can be provided; extension of steel tower line to Ruby or Ripraps power house; and installation of subsequent second, third and fourth units at the Ruby or Ripraps power house, the elevation of the dam to gain higher head, and subsequent changing over of first two units of Ripraps or Ruby plant to accommodate the higher head. This program would extend to 1951. The total cost of the proposed development is estimated by the commission at $28,550,000.

An estimate for extensions and improvements to the Seattle municipal distribution system for next year, amounting to $4,000,000, also was filed by Mr. Ross. In it funds are asked for to extend street lighting, customers' service lines and underground distribution to enlarge substation equipment, raise the voltage capacity of the Tacoma tie line, install oil switches for city substations, and install motor-generator set for railway current at North Station.

Westinghouse Lamp Company Holds Coast Sales Meet

The plans of the Westinghouse Lamp Company for the next twelve months were outlined at the annual sales conference of the company's Pacific Coast district that was held in San Francisco Oct. 25-29, inclusive. All representatives in the district, which comprises eleven states and the territories of Hawaii and Alaska, were present at the meeting, which was presided over by Ray W. Murphy, Pacific Coast manager, and Paul R. Prietsch, chairman.

One of the outstanding features of the annual conference is that each member of the organization selects a subject which he presents in his own way to the assembled members, and at the recent meeting many interesting addresses were delivered.

A complete display of the company's advertising and publicity programs, including sales helps and similar matter, formed the background in the conference room and lent a colorful and cheerful aspect to the proceedings, as the entire display was illuminated. Several demonstrations of lighting and other features were incorporated in the program, which was voted highly successful and effective by the entire conference.

The recreational part of the program consisted of an informal reception on Sunday, Oct. 25, a theater party on Monday evening, Oct. 26, a golf tournament on the afternoon of Oct. 27, and a banquet in the evening of Oct. 28. The golf tournament was divided into a number of foursomes and produced some interesting results, as the players ranged from semi-professionals to novices who had never handled a club before.

Tea Garden and Rest Area at County Fair Make Good Will for Power Company

Among the service booths maintained this year at the San Joaquin Valley district fairs by the San Joaquin Light & Power Corporation with a view to keeping in the public mind the fact that the power company is primarily a corporation for public service was the tea garden with rest-room features at the Fresno District Fair, Sept. 28-Oct. 3.

On a lot 35 x 75 marked off by company poles mounted by the familiar "wishbone" crossarms characteristic of San Joaquin Power and secluded by a bark-covered fence, a frame reception room, a kitchen, rest rooms, and pergolas were built and covered with bark. Against the buildings cedar trees and ferns, brought from the company's mountain power houses, were banked, making a cool fragrant garden background for the tea table.

The main entrance led through tne rustic reception room, the walls of which were covered with photographs of Junior stockholders and large tinted photographs of picturesque scenery in the vicinity of the company's power houses. Pamphlets containing stock sales information and post cards with views of company dams, power houses and other points of interest were on a table for all who were interested. In attendance was a company representative, sufficiently well versed to answer any questions, who personally extended the hospitality of the tea garden.

Beyond the reception room was the tea garden proper with tables half secluded by small carefully placed cedar trees. Two attractive pergolas sheltering benches added both to the garden effect and the seating accommodations.

In the kitchen at the rear of the garden one woman was sufficient to keep the tea hot and replenish the tea pots of the Chinese girls who served. Four Chinese girls were employed, working night and day shifts, with all four present during the rush hours in the late afternoon.

Cots in a room with drawn curtains offered a darkened rest room received in honest appreciation by mothers with tired children and women from out of town weary from a whole day of exhibit seeing.

A feature that held an especial attraction for children was a large cage at the back of the garden filled with doves, pheasants and rabbits.

The tea garden offered a quiet retreat from the jostling crowds, the cool green of a mountain garden making an effective contrast to the noise and dust of the fair. The spot was especially popular with women visitors who would stop a moment to rest and chat over their cup of tea. During the six days of the fair 5,750 people were guests in the power company's tea garden. The appreciative response to the company's service efforts was very noticeable. General comment on the service of the booth shows that returns in terms of good will were many times the investment.

The tea garden was a successful departure from the company's established custom of maintaining a nursery where mothers could leave their children, for a greater proportion of the public benefited by the tea garden and rest-room facilities than had previously been served by the nursery.

Public Relations New Department of Los Angeles Utility

The Los Angeles Gas and Electric Corporation has organized a new department to be known as the public relations department. D. L. Scott, who has been advertising agent for the company, has been appointed manager. A. G. Glass, superintendent of employees, E. P. Ramsey, advertising agent, and O. W. Twitchell, special agent, will report to the new manager of public relations.

In announcing the creation of the new department the management emphasized the fact that this is to be merely a new way to accomplish an old object, namely, the consolidation and co-ordination of the efforts of the entire organization so as to render a first-class service to the public in a way that will meet the public's approval.

Apart from the "maddening crowd," a restful, cool retreat, with an atmosphere of the mountains brought from the company's power houses, the tea garden and rest rooms provided by the San Joaquin Light & Power Corporation at the Fresno County Fair proved so keenly appreciated an accommodation to the women visitors and their children that the company was commended highly for its thoughtfulness and spirit of service.

Melones Power House Started by Pacific Gas and Electric

Ground has been broken and men and material are being assembled for the Pacific Gas and Electric Company's construction camp at the Melones power house site, located one mile downstream from the Melones dam which is now under course of construction 30 miles east of Oakdale, Calif.

The company will maintain a crew of about 125 men to build the power house and the concrete-lined tunnel, 4,500 ft. long, that will carry the water from the dam to the power house.

The construction of sidings and gradings is now under way. The company engineers have located the tramways which will lead from the camp sites to the power house. P. I. Kurtz, who was assistant superintendent of the Pacific Gas and Electric Company's Pit 3 power development in Shasta County will be in charge of the Melones construction.

Under the terms of an agreement between the Oakdale and South San Joaquin Irrigation District and the Pacific Gas and Electric Company (Journal of Electricity, Sept. 15, 1925, p. 226) the irrigation districts will build a dam 200 ft. high and 590 ft. long at a cost of $2,200,000 to impound 112,000 acre-ft. of water. The power company will build the tunnel and the 36,000-hp. plant consisting of two generator units, one mile downstream from the dam, at a cost of $2,500,000. The power house alone will cost $1,900,000.

The stored water will pass through the power house, and the irrigation district will receive $1.25 an acre-ft. for this water from the power company, which will be at a rate sufficient to pay the interest on the bonds and pay off the bonds which the people have voted, by the end of forty years.

Plans call for the completion of the storage reservoir in time to catch the 1926 run-off which will be used for irrigation after passing through the power house.

Southern Sierras Power Company Applies for Revaluation

The Southern Sierras Power Company, Riverside, Calif., has applied to the California Railroad Commission for a revaluation of its plants and properties for the purpose of fixing new rates for that utility.

The company, which operates in Mono, Inyo, Kern, San Bernardino, Riverside, Imperial and San Diego Counties, in California, alleges that the present rates fixed by the Railroad Commission are unreasonable and confiscatory and do not yield a sufficient return upon the value of the property.

The rate schedules of the Holton Power Company, owned by the Southern Sierras company, are to be included in the fixing of any new rates for the latter company.

Colorado River League Former by Upper Basin States

Formed for the purpose of obtaining ratification of the Colorado River compact by all the states, or a similar interstate agreement on the allocation of the waters of the Colorado River among the seven states concerned, the Colorado River League has been incorporated under the laws of Colorado and formally organized. Its membership includes mayors of municipalities, chambers of commerce, civic organizations and state officials of the upper basin states, New Mexico, Colorado, Utah and Wyoming. Officers of the league are: president—L. Ward Bannister, Denver; vice-president for Colorado—L. C. Paddock, Boulder; vice-president for Wyoming—Archie Allison, Cheyenne; vice-president for Utah—A. F. Bigelow, Ogden; secretary-treasurer—Dr. Fuller Swift, Denver. The vice-president for New Mexico has not yet been named. In addition to the officials there is a board of directors of twenty-five members.

In a formal statement issued recently by the board of directors of the league on the Colorado River controversy it was announced that the league now represents between 5,000 and 10,000 persons in the four states of the upper basin. The statement pointed out that there are but two ways to arrive at a solution of the problem of a fair division of the waters of the Colorado River, one by interstate agreement and the other by litigation. Litigation is opposed by the league. Attention was directed by the statement to the Colorado River compact, which provides that out of the average flow of the river amounting to 20,000,000 acre-ft. annually 8,500,000 acre-ft. shall go to the states of the lower basin and 7,500,000 acre-ft. to the upper basin states, the remainder to be allocated in the future. The compact has been ratified by all the states except Arizona and California.

The league sent a special delegation to the hearing before the Federal Power Commission in Washington to oppose the application of J. B. Girand for permit to construct a power plant at Diamond Creek in Arizona.

Denied City Power by Utility Commission in Utah Town

Nineteen persons in the city of Parowan, Utah, lately were denied a permit by the Public Utilities Commission of Utah for authority to take electric energy from the Parowan city electric plant instead of from the plant of the Dixie Power Company, which now is serving the section in which the petitioners reside. The commission also ratified the contract existing between the city of Parowan and the Dixie company whereby the latter will take 200 hp. minimum from the Parowan city plant, so long as the Parowan plant can supply it, at $1.25 per horsepower per month.

The commission states that it is compelled to take into consideration "the effect that granting this petition would have upon the users of power and light in the balance of the territory occupied by the Dixie Power Company. The loss of income now derived by the power company in the vicinity of Parowan, together with the capital loss entailed by the enforced removal of the existing transmission lines, would ultimately have been borne by the users in St. George, Cedar City, Hurricane, Washington, Summit and various other communities and industries now served by it."

The power company will take the service from the city just outside the city power plant, will transform it from 2,300 to 33,000 volts, and will furnish the city also with emergency or breakdown service at the same rates that the city is charging for power, except that there is to be no minimum. Under the terms of the agreement approved, the municipal plant virtually becomes a part of the power company's system as to all power except that required by Parowan and Paragoonah, which are the first concern of the municipal plant.

Confident Six-State Pact Will Bring Colorado Peace

George M. Bacon, state engineer of Utah, as the principal speaker at a recent meeting of the Engineering Council of Utah at Salt Lake City addressed the Council on the subject of the present status of the Colorado River situation. Mr. Bacon, who attended the Senate Reclamation Committee hearings at Los Angeles relative to the six-state pact, stated that in his opinion the pact is going ahead, although there is not much showing on the surface.

He praised the Utah officials and others who are taking an active part in the Colorado River controversy for laying politics aside in the matter and making the welfare of the state paramount. In Arizona, he declared, the issue is being made a political one, with discord and lack of agreement resulting. Mr. Bacon said that the ratification of the six-state pact could be brought about eventually with the cooperation of the states involved.

Northwest Active in Industrial Lighting Campaign

Direct solicitation, rather than a general advertising campaign, is being employed to develop industrial lighting in the Northwest geographic division of the Industrial Lighting Activity, according to word from Henry J. Gille, general sales manager of the Puget Sound Power & Light Company, Seattle, one of the geographic chairmen for the Northwest division.

Because the industries of the Northwest were felt to be more effectively reached by direct personal representation rather than general advertising, attention has been brought to a focus on this type of activity. Sales literature, however, has been distributed, and the campaign already is under headway. While spectacular results are not contemplated, according to Mr. Gille, the field is to be covered thoroughly and lighting in the industries of the Northwest is expected to be improved in many notable instances.

Ensenada, Mexico, Builds Electric Power Plant.—As a vital part of the new civic development program of Ensenada, Baja California, Mexico, construction work on a modern electric power plant is now under way. The initial capacity of the plant will be 200 kw., and it is expected to be completed and put in operation by Dec. 1.

Longest Span Is Strung Across Tacoma Narrows

Claimed to be the longest span in the world, the 110-kv. line from the city of Tacoma's Cushman plant, crossing Puget Sound at The Narrows between Point Evans and Tacoma, recently was strung. The span is 6,240 ft. long, 1,100 ft. longer than that across the Little Tennessee River, said to have been the longest previously strung. The line is strung from steel towers, a donkey engine being used to pull up the cable from the bottom of The Narrows where it previously was laid preliminary to pulling up.

Six cables of special plough steel are being used to span The Narrows on the Cushman line to Tacoma. The cable for each span is calculated to pension, according to press reports. weigh 11 tons, a 24-ton pull being necessary to bring it to required sus- The lines are to be kept at a minimum of 220 ft. above the water level.

Impounding of water behind the Lake Cushman dam began during the latter part of October. The gates of the diversion tunnel were closed with impressive ceremony by city officials and the contractors. Work on the power-house installation, however, has been delayed due to failure of one of the turbine spiral casings under test, with the loss of one life, and will not be completed in the expected time, it was announced.

Power Commission Extends Three Preliminary Permits

The Federal Power Commission has extended until Aug. 20, 1926, the preliminary permit granted the Yosemite Power Company of San Francisco for a development on the Toulumne River and its Middle and South Forks. The extension of the permit was requested by the company so as to grant additional time to arrange for the sale of the power.

The permit of the Home Power Company, of Skagway, Alaska, has been extended until July 17, 1926. The company found it impossible to complete its investigational work during the two years it has had the permit.

The permit of John L. Fish, of Lakeside, Ariz., covering a project on Salt River has been extended until March 6, 1927. The additional time is necessary to complete the investigation of a more comprehensive scheme of development than was contemplated originally.

Bedrock Found for Power Dam on Clearwater River

Working under the direction of J. Lorenz, engineer, Inland Light & Power Company, engineers have located a site on the Clearwater River, a short distance east of Lewiston, Idaho, upon which drillings indicate bedrock at a depth of not to exceed 12 ft. The site is being sought as a location for a dam to be used in connection with a power project.

The site was located about a mile below one favored by J. A. Stevens, engineer of Portland, Ore., when employed by the city at the time it contemplated erecting a dam. The site will necessitate about 4,000 ft. of diking on the river side of a large logging storage.

Mountain States Organize for Industrial Lighting

Under the geographic chairmanship of C. E. Addie, Public Service Company of Colorado, Denver, the organization of the Rocky Mountain Division of the Industrial Lighting Committee, N.E.L.A., has been completed and work has started in the actual campaign activity. Broadsides prepared by the national committee to the number of 4,500 have been distributed, and sales effort to follow these up has begun.

In announcing his organization, Mr. Addie declared that since his preliminary set-up has been completed, the campaign is now under way. Mr. Addie has appointed to handle the publicity of the campaign F. R. Jamison, of the Public Service Company of Colorado, and E. K. Hartzell, of the same company.

The detailed organization is as follows: Public Service Company of Colorado for the cities of Boulder, Lafayette, Windsor, Loveland, and Ft. Collins, Colo., Ed. Rowland, vice-chairman; Cheyenne Light, Fuel & Power Company, Cheyenne, Wyo., C. J. Hughes, vice-chairman; Arapahoe Electric Light & Power Company, Littleton, Colo., W. C. Sterne, vice-chairman; Western Public Service Company, Laramie, Wyo., M. H. Soule, vice-chairman; Public Service Company of Colorado, Sterling, Colo., Howard Newman, vice-chairman; Albuquerque Electric Light & Power Company, Albuquerque, N. M., Arthur Prager, vice-chairman; Public Service Company of Colorado, Leadville, Colo., William Wrenton, vice-chairman; Suburban Light & Power Company, Aurora, Colo., F. A. Einfeldt, vice-chairman; Public Service Company of Colorado, Salida, Colo., W. S. Bates, vice-chairman; Arvada Electric Light Company, Arvada, Colo., C. M. Dunken, vice-chairman; Roswell Public Service Company, Roswell, N. M., F. A. Herring, vice-chairman; Public Service Company of Colorado, Idaho Springs, Colo., George Pascoe, vice-chairman; Natrona Power Company, Casper, Wyo., R. C. Gunnell, vice-chairman; Southern Colorado Power Company, Pueblo, Colo., E. F. Stone, vice-chairman; Jefferson County Light & Power Company, Golden, Colo., E. A. Phinney, vice-chairman; and Public Service Company of Colorado, Alamosa, Monte Vista, Del Norte, Center, and Southern extension, including six towns in Colorado, George Hay, vice-chairman.

A.I.E.E. News

San Francisco Section will hold its next meeting in the new home of the Pacific Telephone & Telegraph Company at 140 New Montgomery Street, as the guests of the telephone company. The speaker of the evening will be C. W. Burkett, consulting engineer for the telephone company, who will discuss the many interesting electrical and structural features of the new building. The meeting will be held Friday, Dec. 11.

Pacific Coast Electrical Association

Commercial Section Outlines Year's Sales Studies at Conclave Meeting

From the announcement of the goals set by the individual committees of the Commercial Section for the year, made at the general meeting of the entire section following individual committee meetings, Nov. 19, that section has set itself to tasks which should mark this year as one of the outstanding years of Commercial Section activity. With each committee pledging itself to definite sales work, the functions of the section are to be pointed toward greater commercial expansion of all electrical industries in the territory of the Pacific Coast Electrical Association.

Opening the general meeting of all section representatives at the conclave, H. M. Crawford, Pacific Gas and Electric Company, San Francisco, Commercial Section chairman, asked first for an outline of each committee's plan of action. He then dismissed the general meeting that the delegates might go into individual committee meetings. After several hours of committee work each of the committee chairmen then was to report to a second general section meeting the definite plan of the work to be undertaken by his committee.

At this second meeting H. K. Griffin, Western States Gas & Electric Company, Stockton, vice-chairman of the section, who was given charge of the meeting, called upon each of the committee chairmen for reports of their respective committee programs for the year.

H. H. Singletary, Pacific Gas and Electric Company, San Francisco, chairman of the electric truck committee, first was called upon for a report. He announced that his committee had decided upon a representative for each district of the Association territory to be responsible for the procuring of a prospect list for electric truck sales, since the committee was pledged to a definite sales program for the year. Sales effort, it was pointed out, last year was devoted to the member companies themselves with the hope of getting each company to use electric trucks itself. This year electric trucking is to be sold to industrial and commercial enterprises from such prospect lists by means of promotional sales letters to prospects. A series of six letters is to be sent out, the first one as a registered letter, Mr. Singletary said, starting Jan. 15. A follow-up letter is to be mailed every two weeks. A reel of motion pictures is to be prepared, in co-operation with electric truck manufacturers, to set forth the advantages of electric trucking. The film is to be used in sales promotion work. The committee also is to ask the Transportation Section of the Pacific Coast Electrical Association for a representation on its committee so that the electric truck will be given consideration in whatever transportation programs are laid out by the operating departments of member utility companies.

Lloyd Henley, San Joaquin Light & Power Company, Fresno, chairman of the customer service committee, next reported on the plans of his committee. Mr. Henley said that his committee work would look back into the past year's committee's work in fostering the more widespread use of the excellent employees' manual prepared by its predecessor committee. An essay contest for employees of member companies, the subject being the actual value of the manual as found by personal experience with it in contact with the public, is to be started. Instructions for executives in backing up the use of the manual are to be prepared by this committee this year also.

F. E. Boyd, General Electric Company, San Francisco, chairman of the power committee, reported that the attention of his committee would be concentrated upon sales of electrical industrial heating installations this year. Two subcommittees are to be appointed, one for the southern part of the state, another for the north, each to interview executives of power companies to impress upon them the value of industrial heating sales effort, and to recommend that men be sent to the National Electric Light Association industrial heating school. As a second major activity, the committee plans to follow up last year's work in the preparation of a limited edition (for power salesmen) of a compilation of Pacific Coast industrial heating applications. Power salesmen also are to be urged to call upon the manufacturers for available lectures and slides on industrial heating applications.

J. W. Wrenn, Great Western Power Company, San Francisco, chairman of the merchandising committee, although his committee had not yet reached definite program conclusions, made a preliminary report. It later developed in meetings of his committee that the more important phases of merchandising would be studied from their sales angles. A special study of electric refrigeration was promised. Another paper on the electric washing-machine situation also is to be considered and presented. But probably the most important step contemplated by the committee is the formation of a month-to-month concentrated sales plan for the selling of small appliances, seeking the unified action of dealers, contractors, jobbers, non-electrical outlets, and power companies. Advertising and special sales, featuring one appliance at a time with every outlet selling or featuring the same appliance at the same time, are to be organized and

fostered. Consideration of the problems relative to servicing appliances also will be given study.

Like the merchandising committee, the cooking and heating committee in a preliminary report was said to be engaged upon a sales study by its chairman, P. P. Pine, San Diego Consolidated Gas & Electric Company. After the Nov. 20 meetings of the committee, however, it was disclosed that the chief activity for the year would be the compilation of a pocket manual for salesmen on each of the phases of work undertaken by the committee. The subcommittees on domestic cooking, commercial cooking, air heating, and water heating, are each to prepare such a manual, all of them to be combined for the ready use of salesmen. The committee as a whole expressed a desire to prepare a spectacular presentation of cooking and heating to be given before the convention next June.

Clark Baker, National Lamp Works of General Electric Company, chairman of the lighting committee, submitted a plan for a far-reaching educational program on lighting. The study of lighting of farms is to be continued by a special subcommittee. Street-lighting practice data are to be brought up to date by another committee. But the most outstanding work which the committee sets itself to do is the preparation of a condensed educational talk, to be given with spectacular effects from a special light box at fifty-eight of the leading business men's organizations of the state. A speakers' bureau is to be organized for this purpose, and to keep commercialism from the presentation the entire subject is to be handled as "what has been accomplished in the use of light," rather than "what we are going to do," according to Mr. Baker.

Announcement was made that another general conclave of the Commercial Section would be held in Los Angeles in February, the date and place to be announced later.

Executive Committee Sets 1926 Convention Dates and Place

A meeting of the executive committee of the Pacific Coast Electrical Association was held in the offices of the secretary in San Francisco on Nov. 20, William Baurhtye, president, in the chair.

The budget requirements of section chairmen were presented and approved after presentation and approval of the treasurer's report.

W. L. Frost, Southern California Edison Company, and F. H. Woodward, Great Western Power Company, were reappointed to the advistory committee of the California Electrical Bureau, succeeding themselves.

It was suggested and approved that it would be to the interests of the Association, with particular respect to publication of convention papers, to have a competent editing committee as such a committee would save the Association considerable money in the cost of printing.

The president announced the appointment of E. R. Northmore as chairman of the general convention committee, and stated that preliminary negotiations were under way with the Biltmore and Ambassador Hotels in Los Angeles with reference to headquarters for the 1926 convention. The committee unanimously approved the selection of Los Angeles for its convention, and the dates were fixed as June 8-11, 1926.

C. T. Hutchinson presented before the executive committee a discussion of the plan of the California Electrical Bureau with special reference to its new organization and the administration of the Red Seal campaign for adequate house-wiring in 1926. Following this a resolution was presented and passed expressing the approval of the executive committee of the plan and work undertaken by the Bureau.

Advertising Section Has Meeting in San Francisco

In common with many other sections, committees and organizations, the Advertising Section, Pacific Coast Electrical Association, held a meeting in San Francisco, Nov. 19. The meeting was held in the Palace Hotel, with a large attendance of utility advertising men. D. L. Scott, Los Angeles Gas and Electric Corporation, chairman, presided.

Reports from the committee chairmen on Standards, Technique, and Better Business Methods were heard, and a further organization of these committees was perfected. A luncheon at noon brought together the delegates in a social period of relaxation between the two sessions held during the morning and afternoon.

P.C.E.A. Committee Personnel for 1925-26 Announced

The chairmen of the various sections, bureaus, committees and subcommittees of the Pacific Coast Electrical Association have been busy making appointments and otherwise perfecting their working organizations. These preliminaries have been practically completed, and below is given a list of the officers of the association and, as of Dec. 1, the committee personnel for 1925-26.

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A. B. Carpenter, S. J. L. & P. Corp.—vice-chairman.

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E. W. Hodges, P. G. and E. Co.

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J. M. Bourus, S. D. Cons. G. & E. Co.

REVENUE AND DISBURSEMENTS COMMITTEE

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E. N. Hoffman, Coast Valleys G. & E. Co.

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J. C. Douglas, Edison Elec. Appl. Co.
R. B. Finley, G. E. Co.
S. W. Green, S. J. L. & P. Corp.
H. K. Griffin, Western States G. & E. Co.
J. C. Hobrecht, J. C. Hobrecht Co.
J. J. Hutchins, Valley Elect. Supply Co.
J. C. Jordan, P. G. and E. Co.
A. C. Joy, S. J. L. & P. Corp.
C. B. Kenney, NePage McKenny Co.
F. S. Myrtle, P. G. and E. Co.
A. H. Nicoll, Western Elect. Co.
J. W. Otterson, Journal of Electricity.
C. H. Pierson, So. Cal. Ed. Co.
J. F. Pollard, Coast Valleys G. & E. Co.
Paul Prietsch, Westinghouse Lamp Co.
F. B. Rae, Pacific States Elect. Co.
Arthur Rowe, Garnett Young Co.
F. N. Smith, Los Angeles.
F. Z. Stone, So. Sierras Pwr. Co.
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J. C. Hobrecht, J. C. Hobrecht Co.
J. J. Hutchins, Valley Elect. Supply Co.
J. C. Jordan, P. G. and E. Co.
A. H. Nicoll, Western Elect. Co.
Paul Prietsch, Westinghouse Lamp Co.
F. B. Rae, Pacific States Elect. Co.
F. N. Smith, Los Angeles.
F. H. Woodward, Grt. Western Pwr. Co.

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H. K. Griffin, Western States G. & E. Co.
F. S. Myrtle, P. G. and E. Co.
J. W. Otterson, Journal of Electricity.
C. H. Peirson, So. Cal. Ed. Co.
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G. C. Tenney, Journal of Electricity.

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C. E. Ingalls, Inc., C. E. Ingalls.
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S. J. L. & P. Corp., R. C. Denny.
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R. E. Cunningham, So. Cal. Ed. Co.
E. C. Fisher, Joint Pole Assn., Oakland.
R. H. Ingersoll, Nevada Cal. Pwr. Co.
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F. A. Short, Safety Elect. Prod. Corp.
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O. C. Miller, L. A. G. & Elec. Corp.
H. H. Minor, S. J. L. & P. Corp.
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H. C. Moyer, P. G. and E. Co.
E. R. Northmore, L. A. G. & E. Corp.
G. A. Peers, Coast Valleys G. & E. Co.
A. C. Putnam, So. Sierras Pwr. Co.
M. H. Schnapp, G. E. Co.
Vinton Smith, Stand. Underground Cable Co.
Paul Suransky, P. G. & E. Co.

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P. H. Ducker, So. Cal. Ed. Co.—vice-chanrman.
D. C. Bertrand, Grt. Western Pwr. Co.—secretary.
W. E. Gallimore, Electric Storage Battery Co.
C. H. Gray, So. Sierras Pwr. Co.
D. P. Mason (member ex-officio), S. J. L. & P. Corp.
Russell Mills, P. G. and E. Co.
J. S. Moulton, S. J. L. & P. Corp.
G. A. Peers, Coast Valleys G. & E. Co.
D. A. Runyard, Cal. Ore. Pwr. Co.
W. J. Schaeffer, L. A. G. & E. Corp.
A. E. Strong, Coast Counties G. & E. Co.
J. M. Wainscoat, S. J. L. & P. Corp.
C. D. Weiss, S. D. Cons. G. & E. Co.
E. C. Wood, P. G. and E. Co.

News of the Electragists

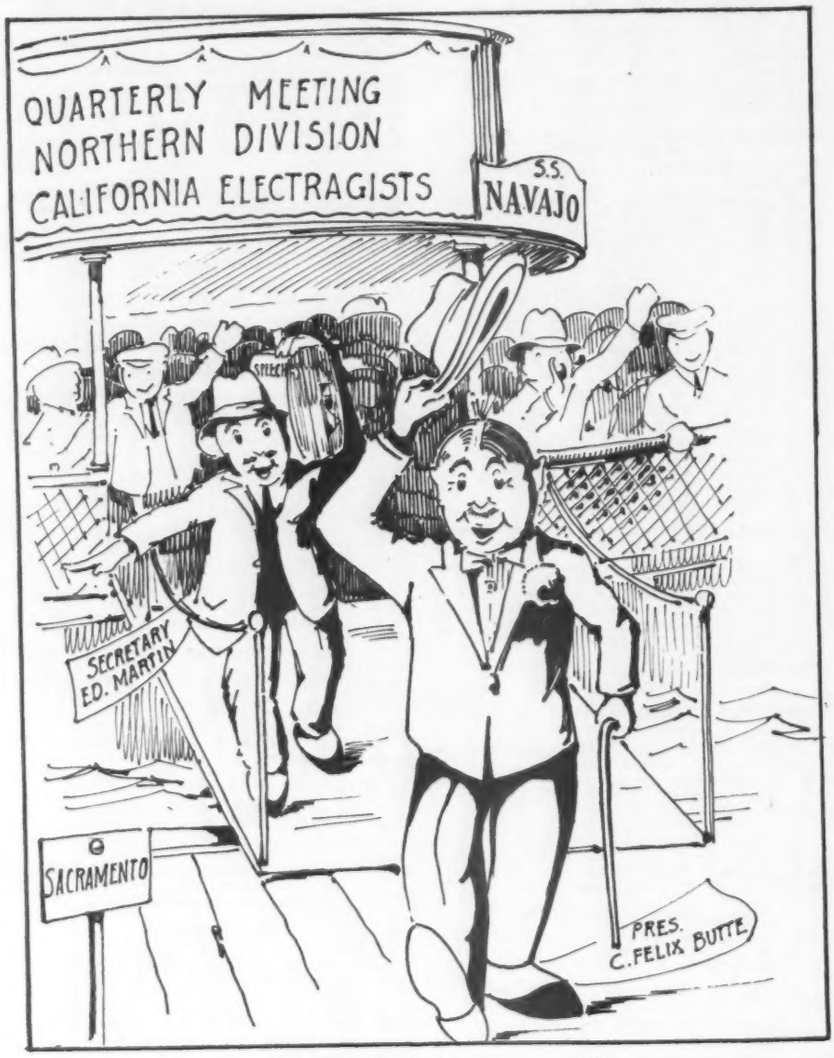
Electragists to Hold Quarterly Meeting in Sacramento

The California Electragists, Northern Division, will hold its quarterly meeting at the Hotel Senator, Sacramento, on Saturday, Dec. 5. The steamer Navajo has been chartered for the occasion to carry the electragists from the San Francisco Bay territory to the capitol city. It will leave San Francisco from pier 5 Friday, Dec. 4, at 5:30 p.m., arriving in Sacramento Saturday morning.

The executive committee will hold its meeting Saturday at 9 a.m. This will be followed by a closed meeting of members at 10 a.m. The general open meeting will be held in the afternoon at 2:00. An extensive program has been prepared, and a large number is planning to attend the meetings.

The return trip will be made Saturday night, leaving Sacramento at 5:30 p.m. and arriving in San Francisco Sunday morning.

J. I. Dixon, city electrician of Santa Clara (left), and Claude W. Mitchell, of the Board of Fire Underwriters of the Pacific, "snapped" at the semi-annual meeting of the California Association of Electrical Inspectors that was held in Fresno, Sept. 24-26. Mr. Mitchell has been especially active in promoting the work of the Association, of which he is secretary. He also has been assisting in the formation of a similar association in the Northwest.



"Well, well, Sacramento, here we are!"

Book Reviews

ELECTRICAL PRECIPITATION

By SIR OLIVER LODGE, D.Sc., F.R.S. 40 pages; $1. Published by the Oxford University Press, American Branch, New York City.

The first chapter, "Natural Precipitation," is an extended discussion and affirmation of the theory of Dr. George C. Simpson promulgated in 1909 and tending to show that the mere breaking of a falling drop of water into smaller drops results in an electric charge. This theory is extended to suggest a very plausible explanation of the heavy electric discharges occurring during a thunderstorm.

The second chapter, "Artificial Precipitation," deals with the classical work of Lodge and Cottrell on dust precipitation and its many practical applications in industry.

The concluding chapter opens an interesting field of speculation as to the possibilities of using artificial electrical charges to assist natural atmospheric precipitation. L.F.L.

PROSPERITY THROUGH POWER DEVELOPMENT

By JULIUS H. BARNES, ARTHUR HADLEY, HERBERT C. HOOVER, SAMUEL INSULL, CARL D. JACKSON, DUGALD C. JACKSON, W. S. LEE, JOHN W. LIEB, FRED R. LOW, A. H. MARKWART, W. S. MURRAY, J. P. NOONAN and GUY E. TRIPP; 59 pages. Abstracted and published by the National Electric Light Association, New York City.

This condensed volume consists of abstracts from addresses presented at the first World Power Conference held at London in July, 1924, by the authors named.

The papers deal with questions of efficient power development as a necessity to the social and economic betterment of the race; and with the practical problems of interconnected power systems; private versus public ownership, and the regulatory work of state commissions.

The symposium is characterized by the strictly logical methods of analysis adopted by the authors, and is agreeably free from emotional and loose generalities. L.F.L.

Bureau of Mines Issues Paper on Permissible Explosives.—A total of 153 permissible explosives, a number of "explosion-proof" coal-cutting machines, permissible electric lamps, permissible flame safety lamps, methane indicators and detectors, electric flash lamps, electric drills, shot-firing units, and storage battery locomotives, and different types of gas masks and mine-rescue breathing apparatus are approved by the Bureau of Mines, Department of Commerce, in Technical Paper 376. Copies of the paper, "Permissible explosives, mining equipment, and rescue apparatus approved prior to Jan. 1, 1925," by J. E. Crawshaw, L. C. Ilsley, D. J. Parker and A. C. Fieldner, may be obtained from the Bureau of Mines, Department of Commerce, Washington, D. C.

Meetings

Red Seal Plan Outlined Before Electrical Bureau

A meeting of the advisory committee of the California Electrical Bureau was held in San Francisco Nov. 23.

After the routine business the main topic of discussion was the consummation of final plans toward the promotion of the Red Seal plan of adequate house-wiring which will constitute the principal work undertaken by the Bureau for the 1926 season.

W. L. Frost, chairman of the finance committee, reported at length as to plans for financing the activities of the bureau during the coming season. The chairman stated that endorsements of the Bureau's plans for 1926 had been given by the Light & Power Association and by the executive committee of the P.C.E.A.

The plan of executing the Red Seal idea consists in brief of the division of the state into twenty-five territorial districts in charge of a chairman and vice-chairman. There will be added to each district committee all of the members of the Electragists International in that district, who will constitute a most important factor in the execution of the plan. House-wiring plans and specifications on which Electragists are called upon to figure will be checked to see whether they conform to the Red Seal standards developed by the Bureau. Those that do conform will be granted preliminary job signs at once while those that do not conform will receive attention at the direction of the chairman of the committee, who will endeavor to induce the house-owner to make such changes in his plans as will raise them to the Red Seal standards. Reports will be sent in to the headquarters of the Bureau at regular intervals giving names of all those householders to whom preliminary job signs have been granted. These names will be distributed to all subscribers to the Bureau funds in order that jobbers and manufacturers may follow up these first-class prospects for the purchase of electrical appliances.

At the suggestion of Mr. Sandoval, it was deemed advisable that the attention of all district committeemen be called to the fact that, since the present minimum requirements of the Red Seal plan call for three No. 4 service wires, due note should be taken of the fact that these are adequate to take care of heating and refrigeration load as well as range load. The goal in each home should be to attain as nearly as possible a 100 per cent domestic electrical installation.

The chairman was authorized to consummate the agreement with the Society for Electrical Development that officially will confer upon the California Electrical Bureau authority to act as its agent in the dispensation of Red Seal licenses. It is believed that before the next meeting of the Bureau, which will take place the latter part of January, that the whole Red Seal program will be in effective operation.

Electric Club Sponsors Lighting Activity in San Diego

Directors of the Electric Club of San Diego, Calif., in a recent meeting unanimously resolved to supply the necessary funds to carry on an industrial lighting campaign in that city. They have instructed the secretary to obtain the necessary literature from the Industrial Lighting Committee, National Electric Light Association, and have appointed committees to carry on this campaign actively.

A meeting has been scheduled at which a prominent speaker, a member of the Pacific Coast Division's educational committee, will appear to lay before the organization the plans of the Industrial Lighting Campaign.

While San Diego is not regarded generally as having many large industries, it is planned, nevertheless, to pay more detailed attention to the smaller industries and to the promoting of better commercial lighting.

Oakland Contractors Overflow Lighting Meeting

At a dinner gathering which overflowed the dining room, Oakland contractors, jobbers, manufacturers' agents and power company representatives heard and agreed with the line-up for the Industrial Lighting Activity as presented by the educational and sales committees for northern California, Friday evening, Nov. 13, at the Newport Cafe. The attendance at the meeting was the largest reported for any similar gathering in the district.

L. F. Galbraith, division sales manager for the Oakland division, Pacific Gas and Electric Company, presided over the meeting, introducing first, Clark Baker of the National Lamp Works, and chairman of the educational committee, who outlined the plan of the Industrial Lighting Activity from its national as well as state or district aspects.

Felix Butte, vice-president of the California Electragists, was the second speaker, pointing to the interests which contractors might hope to develop through the campaign. Leo Gianini, of the educational committee, and a member of the sales staff of the Edison Lamp Works, gave a demonstration of methods by which contractors might convince prospects of the value of efficient and correct industrial lighting.

E. Zimmerman, Pacific States Electric Company, followed with anecdotes of sales experience, designed to show the value of selling lighting results rather than price of job. H. H. Robinson, electric salesman for the Pacific Gas and Electric Company, told of experiences contractors already were having in the sales of better industrial and commercial lighting installations. Walter Vance, contractor of Oakland, Clyde Chamblin, president California Electrical Construction Company, and Earl Browne, of the Browne-Langlais Electrical Construction Company, also spoke briefly upon the value of the campaign to the industry.

COMING EVENTS

California Electragists, Northern Division—Quarterly meeting at Sacramento, Senator Hotel, Dec. 5, 1925

Technical Section, P.C.E.A.—Conclave—Fairmont Hotel, San Francisco Jan. 13-15, 1926

Pacific Coast Electrical Association—Annual Convention—Biltmore Hotel, Los Angeles June 8-11, 1926

National Association of Railroad and Utilities Commissioners—Kansas City, Baltimore Hotel Feb. 9-12, 1926

Harvest Hands Party Put on by Colorado Electrical League

Harvest Hands' Wild West was the appelation given to the recent entertainment of the Electrical League of Colorado in Denver, a combination fall frolic, Wild West show, and general good time, with the advantages of all and the drawbacks of none.

Various games of the days when the West was still a frontier and where chance played a large element proved a big drawing card. The medium of exchange was ornate scrip labelled "volts." County fair attractions, such as candy wheels, horse races and the like, including turkey raffles also were featured.

Entertainment was provided throughout the program in the form of vaudeville acts and included a championship Charleston contest. Dancing closed the program at midnight. An attendance of over 300 was recorded.

The committee which sponsored the affair and was headed by E. P. Kipp consisted of K. L. Francis, Robert Miller, W. L. Kaffer, A. E. Bacon, and Clarence Keller. They were assisted by representatives of one of the American Legion posts in Denver.

Bleak Winner in Rocky Mountain League Golf Tourney

R. M. Bleak, superintendent of lighting and appliance sales of the Utah Power & Light Company, won a handsome loving cup in the electrical golf tournament held in Salt Lake City during June, July and August. The tournament, sponsored by the Rocky Mountain Electrical Co-operative League, was participated in by thirty-six golfers, representing the central station, jobbers, manufacturers and contractor-dealers. Three legs were played, the first in June, the second in July, and the third in August.

A number of prizes were donated by the jobbers and central station branch of the industry, and the loving cup was donated by the manufacturers for low gross for the tournament. A $10 golf club went to the winner of each leg; a dozen golf balls to the runner-up, and a $10 club was awarded for low gross.

Following are the results: June leg—won by H. B. Summerhays of the Westinghouse Lamp Company; L. J. Batty, of the General Electric Company, runner-up. July leg—R. M. Bleak, winner; George B. Thomas, of the Utah Power & Light Company, runner-up. August leg—F. H. Young, of the Phoenix Utility Company, winner; J. L. Lawrence, of the Salt Lake Electric Supply Company, runner-up.

Seattle Electric Club Has New Quarters.—The Electric Club of Seattle has secured permanent quarters in the Chamber of Commerce Building, Third Avenue and Columbia Street, where all meetings of the organization hereafter will be held. The club meets Monday of each week at noon, adjourning at 1:30.

Personals

R. R. Cowles, chairman Technical Section, P.C.E.A.; **H. L. Doolittle,** past chairman Technical Section and now a member of the executive committee; **G. A. Riley,** chairman overhead systems committee; **J. W. Andree,** chairman prime movers committee; **W. R. Frampton,** chairman safety rules committee, who also represented the meter committee and the accident prevention committee; **Walter Dreyer,** chairman hydraulic power committee; and **P. E. Chapman,** chairman underground systems committee, all have returned from Detroit where they attended the group meetings of the Technical Section, N.E.L.A.

James R. Cravath, consulting electrical and illuminating engineer, has opened an office at 407 Call Building, San Francisco, in addition to his Richmond office.

F. M. Randlett, formerly with the water department of the city of Portland, Ore., has been appointed district manager for Robert W. Hunt Company, with offices in the Lyon Building, Seattle.

N. H. Callard, who for the past nine years has been associated with the Salt Lake City office of the Westinghouse Electric & Manufacturing Company, has been transferred to the general sales department of that organization in New York City. In his new position he will handle problems pertaining to the co-ordination of work between the various district offices and factories of the company.

J. H. Pengilly of Brown & Pengilly of Los Angeles has moved to San Francisco in order better to serve his business interests in the Western Safety Manufacturing Company of the latter city that is allied with the Los Angeles firm.

F. B. Riley, who has been manager of the cabinet division of the Kelvinator Corporation of Detroit, has been appointed general manager of the commercial division of The Servel Corporation, New York.

R. T. Strong, for the last three years manager for the Westinghouse Electric & Manufacturing Company at Omaha, Neb., has been made manager of the transportation division of that company's Seattle district, succeeding **A. W. Eshelby,** who has been transferred to the Chicago district. Prior to the war Mr. Strong was connected with the Portland Electric Power Company, Portland, Ore.

E. O. Shreve, district manager, General Electric Company, San Francisco, shortly departed for the East where he will confer with company officials at Schenectady and New York.

H. H. Kerr, W. D. Hardaway, E. Neibe, and **C. F. Dwyer** represented the Public Service Company of Colorado at the recent convention of Doherty plant operators in Chicago.

B. J. Rowan has recently been transferred from the general offices of the General Electric Company at Schenectady to Denver where he will be assistant to **Robert Miller,** manager of the company's offices in that city.

Dean K. Chadbourne has been appointed general manager of the Westinghouse Electric International Company to succeed **E. D. Kilburn** who recently was elected vice-president of the Westinghouse Electric & Manufacturing Company, East Pittsburgh.

P. B. Harris, chief engineer of the Los Angeles Railway, returned early in November from the recent convention of the American Electric Railway Association at Atlantic City. The return trip was made via the Panama Canal.

Robert I. Minson has been made manager of the San Diego branch of the Federal Electric Company, succeeding **Herbert Rose** who is now in charge of the radio department of Holzwassers, Inc. Mr. Minson was connected with the investigation department of the San Diego Consolidated Gas & Electric Company for nine years and subsequently was with the investment department of the Southern California Edison Company.

Dr. Oskar von Miller, noted hydroelectric and hydraulic engineeer of Munich, lately arrived in San Francisco enroute to New York. To Dr. von Miller is due the credit for the establishment in Munich of the German Museum, which is devoted to engineering and other technical subjects, and he has been invited to attend a conference in New York for the purpose of consulting with a number of scientists and engineers interested in establishing a similar museum in

DR. OSKAR VON MILLER

America. Dr. von Miller was one of the experts who accompanied the German delegates to the Versailles conference. Since the war he has been very active in the construction of hydroelectric development projects in Germany made necessary by the taking over of the coal mines by the French. At the present time he is president of the commission in charge of railroads in Germany. While in California Dr. von Miller expressed much interest in the hydroelectric developments there and visited a number of the more important projects.

W. D. Shannon, general superintendent of construction for Stone & Webster, Inc., who has had entire charge of the Baker River project of the Puget Sound Power & Light Company, Seattle, has received recognition of his services through having the body of water formed by the dam named for him. The lake is to be known as Lake Shannon.

W. S. Rugg, general sales manager, Westinghouse Electric & Manufacturing Company, East Pittsburgh, has been made a vice-president of the company.

William Baurhyte, president Los Angeles Gas and Electric Corporation, has returned from an extended tour of the East. On his return trip Mr. Baurhyte stopped at Chicago for a meeting of the executive committee of the National Electric Light Association, of which he is a member as president of the Pacific Coast Electrical Association.

A. L. Spring, for the past several years merchandising specialist of the General Electric Company in Los Angeles, is leaving that company to accept a position as sales manager for the Servel Refrigeration Company. Mr. Spring's headquarters will be in Los Angeles.

J. P. Bowden, Western representative of the Edison Electric Appliance Company, recently made an extensive business trip through Arizona.

A. M. Fitch, Harrison-Fitch Electric Company, Pomona, Calif., was in Los Angeles on business recently.

H. T. Simmons, who has been with the Western Electric Company for a number of years, has been made assistant sales manager of the organization in Los Angeles. **P. W. Todt,** formerly with the same company in San Francisco, has been transferred to Los Angeles as stores manager.

R. M. Alvord of the General Electric Company, San Francisco, was in Los Angeles on business recently.

Martin L. Pierce, sales research engineer for the Hoover Electric Company, recently gave an interesting talk on "Why People Buy" over a Seattle radio station.

Verne D. Harrison, Pacific States Electric Company, recently returned to Seattle after a two-months stay in Alaska.

J. C. Gaylord, substation designing engineer, and H. L. Sampson, substation engineer, both of the Southern California Edison Company, Los Angeles, not long ago spent some time in the San Francisco Bay region on an inspection tour of local substations.

A. E. Wishon, vice-president and general manager of the San Joaquin Light & Power Corporation, Fresno, Calif., recently visited New York and other Eastern cities. He was accompanied by Mrs. Wishon.

L. G. Gianini, for the past four years connected with the Edison Lamp Works of the General Electric Company, San Francisco district office, has been appointed lighting specialist for that office.

Victor W. Hartley, executive secretary of the California Electrical Bureau, spent several days in Los Angeles recently.

R. E. Fisher, vice-president in charge of public relations and sales, Pacific Gas and Electric Company, San Francisco, recently visited El Paso where he was shown over the porperties of the El Paso Electric Company.

Harold K. Fox, construction superintendent, San Joaquin Light & Power Corporation, Fresno, visited San Francisco not long ago.

L. A. Nott, Sangamo Electric Company, San Francisco, lately departed for a trip through the Northwest.

A. C. Cornell, chairman of the Electrical League of Colorado and manager of the Western Electric Company in the Mountain District, has been named a member of the Committee of Fifty sponsoring the annual Community Chest Drive in Denver.

Joseph Wells, of Fobes Supply Company, recently returned to Seattle after a sojourn in Prince Rupert, B. C.

John W. White has been appointed general manager of the recently organized Westinghouse Electric Company of Japan. Mr. White has been in the employ of the Westinghouse company for many years and was formerly manager of the Westinghouse Electric International Company's branch office at Havana, Cuba.

Victor C. Moulton, formerly of the industrial division in the Denver office of the Westinghouse Electric & Manufacturing Company, has been assigned to the southern Colorado territory as company representative with headquarters at Pueblo.

A. J. Johnstone, auditor, and **J. A. Rockwood,** engineer, Portland Electric Power Company, Portland, attended meetings of the Accounting Section, N. E. L. A., in St. Louis, in October.

F. W. Brownell, comptroller, Puget Sound Power & Light Company, Seattle, went to St. Louis in October to attend meetings of the Accounting Section, N.E.L.A.

C. W. Fick, Northwestern engineer of the General Electric Company, recently discussed "Electricity in the Manufacture of Paper," at a recent meeting of the Seattle branch of the A.I.E.E.

C. V. Allen, formerly manager of the Westinghouse Electric International Company in Mexico, has been elected assistant treasurer of the company, with headquarters in New York City as general assistant to **H. A. Carmichael,** treasurer. **Clayton T. Rogers,** sales manager for the Mexican branch, has been named acting manager succeeding Mr. Allen.

J. P. Bowden of the Edison Electric Appliance Company has returned to Los Angeles from a business trip to San Francisco.

H. S. Robertson, vice-president and general manager of the Denver Tramway Corporation, addressed the advisory board of the Electrical Co-operative League in Denver recently.

Robert Wolfers has joined the McGraw-Hill Company, Inc., New York, and will be in charge of directories, lists and a direct-mail department which is being developed to serve McGraw-Hill advertisers. The E M F Electrical Year Book recently has been purchased. Other McGraw-Hill reference publications are McGraw Central Station Directory, McGraw Electric Railway Directory and The Radio Trade Directory. It is planned to extend the directory and list services into other industries now served by McGraw-Hill publications. Mr. Wolfers formerly was connected with The Automobile Trade Directory and Chilton Automobile Directory. **J. S. Cortelyou,** who for the last year has been devoting his time to the Radio Trade Directory, in future will direct the compilation of all Mc-Graw-Hill directories and lists. Mr. Cortelyou was associated for many years with Mr. Wolfers in the automotive directory business.

J. A. Cannon, auditor; **J. M. Bourns,** assistant auditor; **A. R. Foster,** superintendent of collections department; and **G. N. Riblet,** auditor of stores, attended the annual accountants' convention of the Byllesby Engineering & Management Corporation, as representatives of the San Diego Consolidated Gas & Electric Company. This convention was held in Chicago, Oct. 26-29, inclusive.

A. H. Tracy, electrical engineer, Byllesby Engineering & Management Corporation, recently spent several days with the San Diego Consolidated Gas & Electric Company in connection with engineering contracts now in progress. Mr. Tracy has included in his itinerary all Pacific Coast properties under Byllesby management.

S. P. Russell, part owner and vice-president of the H. B. Squires Company of San Francisco, Los Angeles, Portland and Seattle, was elected unanimously chairman of the San Francisco Bay Cities Chapter of the Illuminating Engineering Society for the new fiscal year. Mr. Squires, who makes San Francisco his headquarters, has been devoting much of his time and attention to the subject of lighting, that very important phase of the electrical industry. He has been connected with that industry practically all of his business life. After graduating from the California School of Mechanical Arts in San Francisco, he went to work in the drafting room of Charles C. Moore & Company, Engineers. In 1903 he left there to join the Holland Supply Company, a firm handling steam and electric railway supplies, and a short while later took over the concern. In 1905 he sold out to Johns-Manville, Inc., and took charge of that company's electrical department for the Pacific Coast. A year later he joined the company's New York organization, and in 1907 opened an office for the concern in New Orleans. Returning to San Francisco in 1908, he remained with Johns-Manville, Inc., until 1918 when he became associated with the H. B. Squires Company.

S. P. RUSSELL

George Barbour, formerly sales agent at Mount Vernon, Wash., for the Puget Sound Power & Light Company, Seattle, has been promoted to be sales manager of the northern district of that company with headquarters at Bellingham, Wash., taking the place of **R. W. Lindley,** transferred to Seattle as manager of merchandise sales.

Lewis A. Lewis, president of the Northwest Electric Light and Power Association and sales manager of The Washington Water Power Company, Spokane, recently made a flying trip to Seattle and Boise on matters connected with the range and water heater survey in the Northwest.

V. H. Greisser, chief engineer, The Washington Water Power Company, Spokane, will be in full charge of the company's Chelan Lake power development. **Arthur Turner,** formerly chief engineer in the Columbia River Basin Survey, will be construction engineer.

Mel Hirsch has been made manager of the newly opened San Francisco branch of the Electric Supply Company of Oakland, Calif.

A. C. Cornell, manager of the Western Electric Company in the Mountain region, visited the Salt Lake City branch of the company several weeks ago.

Obituary

Oliver D. Colvin, for many years connected with railway and power interests in Seattle, recently died in that city. Mr. Colvin was vice-president and general manager of the old Snoqualmie Falls Power Company and the Seattle-Tacoma Power Company, and previous to that time was associated in official capacity with the Seattle Consolidated Street Railway Company and the Rainier Power Company. During the last few years of his life he developed the Seattle Car & Foundry Company.

Arthur Lyman Hawley, for many years connected with electric interests in Seattle, recently died in that city. He was for a number of years manager of the Union Electric Company, which at that time furnished practically all the electric service in the city. He later became interested in municipal ownership.

James S. Walker, Jr., president of the Walker Electric Company, Salt Lake City, Utah, died suddenly Nov. 20. At the time of his death Mr. Walker was president of the Contractor-Dealers' Association.

Charles W. McKillip, for the past twenty years district manager at Sacramento, Calif., for the Pacific Gas and Electric Company, dropped dead in that city, Nov. 20.

George Young Allen, technical assistant to the manager of the radio department of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, was killed Nov. 12 in a railroad accident while returning from the fourth annual radio conference at Washington, D. C.

Allen A. Tirrill, consulting engineer of the Westinghouse Electric & Manufacturing Company, and inventor of the Tirrill voltage regulator, died recently at the age of 52. Prior to his connection with the Westinghouse company he was associated with the General Electric Company for many years. In 1914 he was awarded the John Scott legacy medal for meritorious inventions. He was a member of the A.I.E.E.

TRADE NOTES

R. R. Poppleton, Inc. is the name of a new $150,000 corporation which has been formed to take over the business and good will of R. R. Poppleton, Portland, and Thompson & Castleton, Seattle. Complete stocks of electrical machinery as well as complete repair shops will be maintained at both places. The Portland business has been established eleven years and the Seattle business seven years. R. R. Poppleton will continue in charge as president and general manager of the business. V. E. Weber will be manager of the Portland branch and Harold S. Smith, formerly with the Pacific States Electric Company at Fresno, Calif., will be manager of the Seattle store.

Link-Belt Company, Chicago, has published an interesting booklet containing the history of the company over a period of fifty years and describing the development of the conveying machinery business, starting with the invention of the Ewart detachable link belt in 1875. The book contains a series of drawings depicting scenes from early times to the present day.

MacRae's Blue Book Company, Chicago, has acquired control of Hendricks Commercial Register, and the next edition will be a general directory, known as "MacRae's Blue Book, consolidated with Hendricks Commercial Register." The consolidated publication will blanket not only the steam and electric railroad field but also the worth-while industries of America, including public utilities.

J. G. White Engineering Corporation, New York City, has published "Petroleum Refining," a booklet which gives a brief history of petroleum and of refining and then presents various views of a complete modern oil refinery, stressing the importance of proper design, construction and operation in increasing efficiency and reducing production costs.

The P. A. Geier Company, Cleveland, has issued a new forty-page sales manual entitled, "Royal Sales Methods, a Handbook of Success," which covers the subject of house-to-house salesmanship. It contains chapters on demonstrating the company's Royal electric cleaner, the structure and care of rugs, and hints contributed by eighteen or more successful retail salesmen.

Driver-Harris Company, Harrison, N. J., has purchased the works and properties of the Electrical Alloy Company at Morristown, N. J., to take care of its increasing business. The Morristown plant will be operated as the Electrical Alloy Division of the Driver-Harris Company, and the main offices and sales department will be located at Harrison.

Erie Malleable Iron Company, Erie, Pa., has issued a small booklet containing the story of the Emico kondubox line of threadless conduit fittings. The booklet states this new box is so designed as to eliminate costly operations and furnish many economic advantages.

Delco Light Company, 1518 West Pico Street, Los Angeles, has doubled its floor area and rearranged its quarters to provide additional showroom facilities for the sale of electric refrigerators. This store is a factory branch of the Delco Light Company, manufacturers of Frigidaire electrical refrigerators. Ivan de Jongh, local manager for the company, states that the increasing interest in this type of refrigeration for private homes throughout the country has made it necessary for the Delco Light Company to adopt a general policy of expansion for all its sales branches. The Pasadena showroom and salesfloor recently has been moved to larger quarters on Colorado Street opposite the Maryland Hotel to enable the branch to meet the demands put upon it.

The Empire Lighting Fixture Company, of Los Angeles, with J. F. Mortensen at its head, has established a branch retail store and showroom at the corner of East Green and Chester Streets, Pasadena, Calif. This is the fourth store to be opened by this company. Its factory is located at 3160 Glendale Boulevard, Los Angeles.

G. L. Halck Sales Company, San Francisco, has taken over recently the line of the Esler Electric Manufacturing Company, Marion, Ind., that includes heaters, two-way plugs and quad receptacles for table use.

H. M. Byllesby & Company, Chicago, has issued a booklet entitled "Scope and Service," which gives a history of the organization and discusses public utility securities.

General Electric Company, Schenectady, has issued bulletin GEA-103 on street-lighting glassware. The booklet is illustrated profusely with photographs and drawings and contains a complete list of globes with their descriptions.

Roller-Smith Company, New York City, has opened a branch office at 493 No. Boulevard, Atlanta, where the company business will be conducted by the **Tennessee Engineering & Sales Company.** The **Roller-Smith Company** also maintains offices at 101 Milk Street, Boston, and 152 Temple Street, New Haven, where the **Detweiler-Bell Company** is acting as agent.

Western Cedar Association, Spokane, Wash., has issued a large eight-page folder, well illustrated, and describing and presenting the qualities of its red cedar poles.

Trumbull Electric Manufacturing Company, Plainville, Conn., has issued catalog describing and illustrating its new line of panel boards for residence use.

Birkel & Le Gassic, electrical supply jobbers of Santa Monica, Calif., have announced the appointment of A. T. Richardson as office manager. Mr. Richardson was connected formerly with the Wholesale Electric Company of San Francisco.

Edward T. Moore, Syracuse, N. Y., recently has brought out a new model of the Edmoore demand limitator, an electrical device for automatically controlling maximum demands or peak loads on electric power systems.

The Ideal Electric & Manufacturing Company, Mansfield, Ohio, has issued bulletin 110, describing its type "AA" double squirrel-cage automatic self-starting induction motor.

Allis-Chalmers Manufacturing Company, Milwaukee, has announced the Texrope drive which is claimed to be an entirely new type of short-center, flexible drive and an important development in the field of power-transmission machinery.

Delta-Star Electric Company, Chicago, has issued a net price list on standardized outdoor substations. These prices took effect Oct. 15 and will remain in force until March 15, 1926.

Gulf Electric Appliance Company, Inc., Tampa, Fla., distributor for the Wesix hot water heaters and air heaters, has increased its capital stock to $70,000, also issuing $50,000 preferred stock to take care of its large field.

Fond memories of times gone by! Gazing at this fine-looking group of Sea Scouts reminds us of the way these energetic youngsters gallantly exercised their sea-going legs and their overstrained vocal chords paging delegates around the convention auditorium in San Francisco during the N.E.L.A. gathering last June.